2 Practice and meaning in spiral-wrapped batons and cords from Cerrillos, a Late Paracas site in the Ica Valley, Peru

Jeffrey C. Splitstoser

Abstract

This chapter considers a series of wrapped batons and wrapped cords discovered in 2003 by Mercedes Delgado and Dwight Wallace at the Paracas site of Cerrillos, on the South Coast of Peru, near Ica. Cerrillos was a civic-ceremonial site inhabited from approximately 850 to 200 BCE, and the objects under discussion belong to the Late Paracas Period, *c.* 350–200 BCE. They were found in the tomb of an adult individual, whose sex has not been determined. The chapter considers how these objects were made and, by combining archaeological evidence, ethnohistorical and ethnographic analogy, and semiotics, develops a coherent theory regarding the significance of these incredibly important, yet enigmatic objects.

Key words

Batons and cords, spiral wrapping, *tekhnē*, *khipu*, *waraña*, heads, hair, colour, pattern, symmetry, Andean textiles, Late Paracas Period, Cerrillos – Peru.

During the summer of 2003, a tomb was excavated under controlled conditions at the site of Cerrillos,[1] which had an uninterrupted occupation from *c.* 850 to 200 BCE corresponding with Early to Late Paracas and Ocucaje Phases 1–9 (Menzel *et al.* 1964). The site is situated in the upper Ica Valley on the South Coast of Peru. Among the tomb's contents was an adult individual, whose body and textile wrappings have not been studied, and who was surrounded by approximately ten wooden sticks. Here they are called batons, because they are about the same size and shape as a police baton, and they seem to have been meant to be held. These batons are wrapped with colourful camelid-hair yarns, and attached to the batons are equally colourful pattern-wrapped cords.

The bands on these wrapped objects are embedded with attributes of colour, twist direction, and number, where numeric quantity is determined by counting the number of times a yarn wraps around a baton or cord. Each attribute forms a unique pattern with mirror symmetry. These objects resemble weaving tools called *musa waraña* (an Aymara term meaning 'model for colour combinations') which are used by Andean weavers today, as they were used in the past, to codify complex warp colour patterns (Arnold and Espejo 2012). The Cerrillos wrapped batons and cords also have strong resemblances to Middle Horizon and Inka *khipu* (or *quipu*). These similarities suggest the possibility that: (1) the Cerrillos wrapped objects might have been used to codify information, and (2) they might be precursors of *musa waraña* and/or *khipu*.

The use of colour, slant or spiral direction, and count to create repeating, symmetrical patterns is also found in embroidered Necropolis-style textiles and Middle Horizon tapestry tunics (see for example Frame 2001a, 2006), which suggests that the wrapping patterns found in the Cerrillos objects might be an early manifestation of a uniquely Andean, fibre-based system that was used to record, process, and broadcast information.

This chapter consists of five parts, beginning with a brief account of the archaeological context of the objects, followed by a technical description of the collection and how the objects were made. As this is the first time these objects have been published, this section is rather detailed. This is followed by a discussion of their archaeological and iconographic

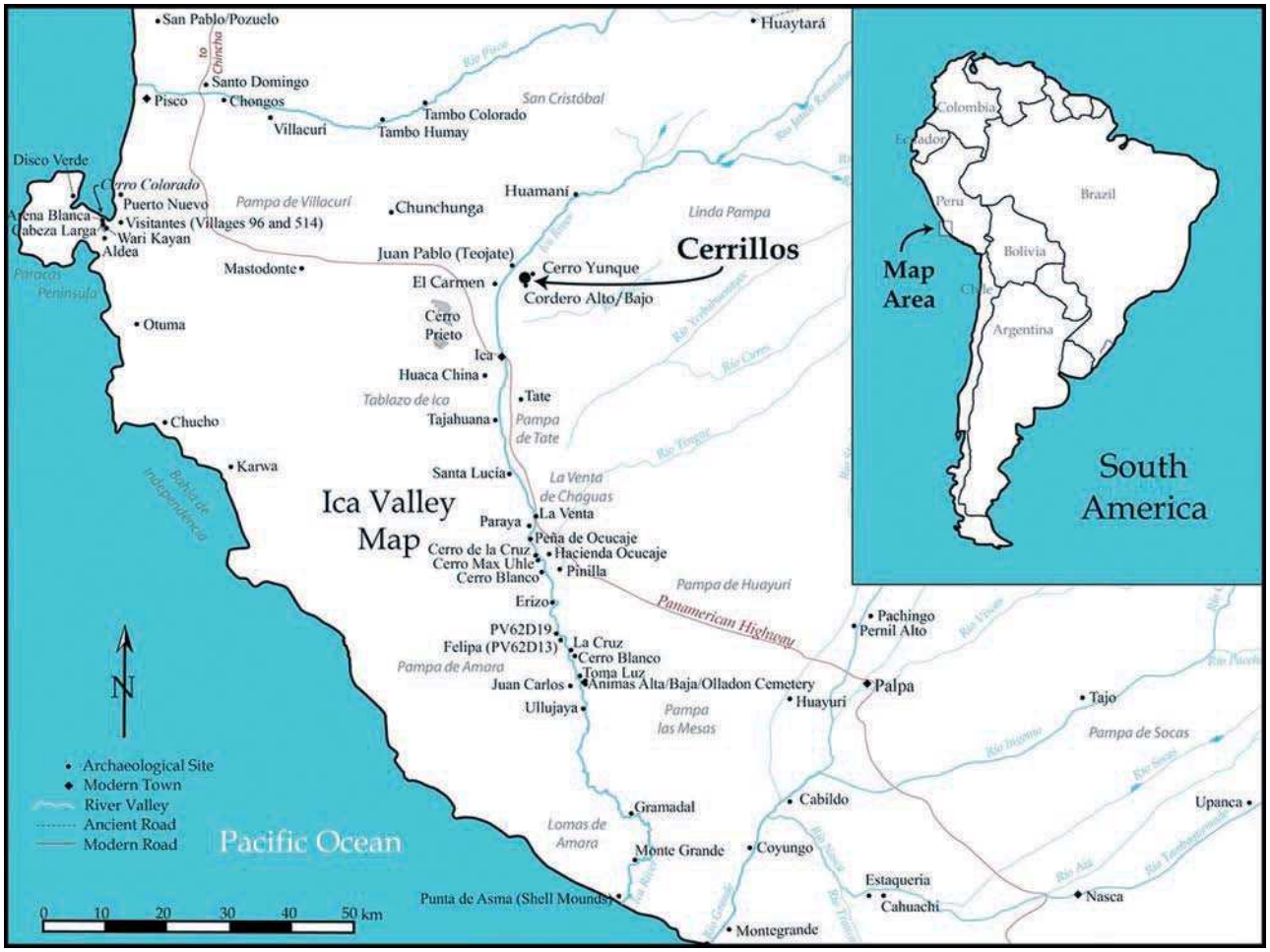


Figure 2–1. Map of Cerrillos and the Paracas region of Peru.
(Source: Author's drawing.)

associations, and then of the significance of spirals and spiral wrapping. The final section discusses a semiotic approach to understanding their band patterns.

The chapter contributes to the volume's examinations of Andean textiles as cultural records, to issues regarding their documentation, and to comparisons between textiles, *khipus*, and interrelated semiotic practices. *Tekhnē* is taken to mean knowledgeable practice and practical knowledge, where ideas and philosophies about, for example, wrapping and spiral structures were enacted and created through spiral movements and practices, as transformational activities in which ancient technicians literally 'made meaning'.

Context: the site of Cerrillos and a tomb's contents

The South Coast of Peru is one of the rare places on earth where climate conditions permit the preservation of 3,000-year-old textiles, wood, and other perishable objects. Cerrillos is situated at the base of a hill about 100 m high that forms the western terminus of a spur that extends from the still higher Andes mountains. The site is approximately 10 km north of the modern city of Ica, at the junction where the Ica River emerges from the mountains and turns to flow south all the way to its mouth in the Pacific Ocean some 150 km away (Figure 2–1).

The tomb containing the wrapped batons and wrapped cords (Figure 2–2) was made by cutting through the floor of an upper terrace. In addition to its adult occupant, the tomb contained the skeleton of a child, three large *ollas* (pots) and other ceramics, baskets, matting, and textile-wrapped bundle offerings. There were spindle whorls and balls of yarn. There was also a ceramic bowl (Figure 2–3) stylistically assigned to Phase 9 of the Ocucaje Ceramic Sequence (OCS) (Menzel *et al.* 1964: 334, fig. 316, type 317e).[2]

Phase 9 corresponds with early Late Paracas, which was a time of significant change in the Paracas region, an area that consists of the entire

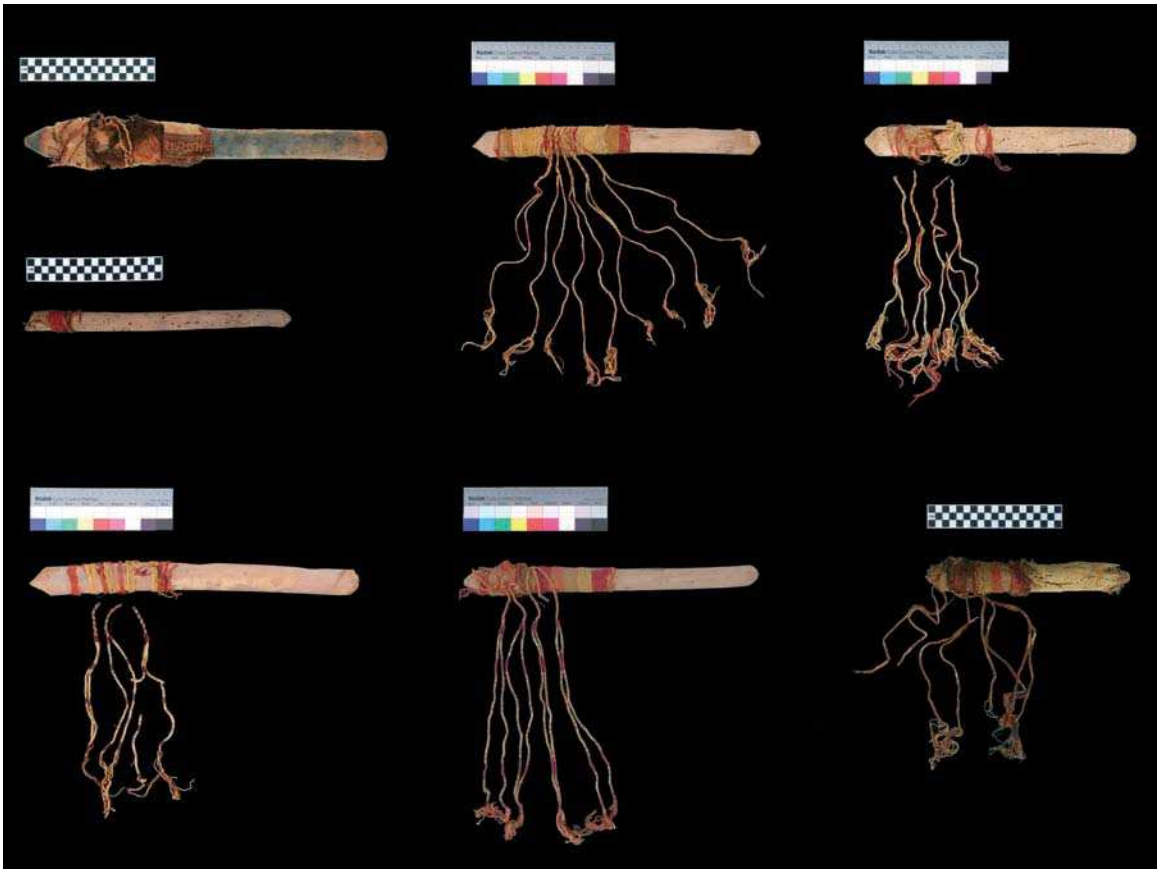


Figure 2–2. All baton groups.

(Source: Museo Regional de Ica. Top row, left to right: Group 1, 2003-L921A; Group 4, 2003-L921D; Group 6, 2003-L1032. Middle row: Group 2, 2003-L921B. Bottom row: Group 3, 2003-L921C; Group 5, 2003-L921E; Group 7, 2003-L912B. Author's photographs.)

Figure 2–3. Phase 9 ceramic bowl.

(Source: Museo Regional de Ica. Author's photograph.)

Ica Valley extending north to the Paracas Peninsula and the Pisco Valley, and south to Palpa and the Río Grande de Nasca. Late Paracas (Phases 9–10) witnessed the rise and dominance of Ocucaje. It was a time of increased warfare, when people were moving from dispersed settlements in enclaves to large fortified sites (Cook 1999; DeLeonardis 2005; Massey 1986, 1991). It was at this time that the practice of head taking began in the region. By the end of Phase 10, the region was also home to the cultures of Necropolis-Topará and Nasca (Peters 1997: 895–904; Van Gijseghem 2004).

These changes most likely occurred over a relatively short period of time, perhaps as little as 100 years. For this reason, objects from Necropolis-Topará and Early Nasca contexts are included in the study. Because Cerrillos has an unbroken sequence of habitation from Phase 1 (and probably earlier) to Phase 9 (Splitstoser *et al.* 2010), Early and Middle Paracas (Phases 1–5 and 6–8, respectively) objects are included as appropriate.

The collection of wrapped batons and cords

The objects that are the subject of this study include wrapped batons, individual wrapped cords, wrapped-cord groups, and baton-cord groups. Descriptions of these categories are provided below.

Batons

Batons are pointed wooden sticks about the size of a US police nightstick. They have an average length of 47 cm (range of 40 to 52 cm) and an average diameter of 4 cm (range of 2.5 to 4.5 cm), where the pointed end is slightly thicker than the distal end. There are seven batons plus several baton fragments that might have comprised two or three more examples. Six batons have spiral wrapping with camelid-hair yarns. Baton 1, which is the largest in both length and diameter, and the only baton that is painted (a gunmetal-blue colour), was wrapped not with yarn but with a cotton plain-weave textile with camelid-hair warp stripes along each weft selvedge, and bands of stepped-diamond designs at each warp end, made of two-colour complementary-weft patterning with camelid-hair yarns (Figure 2–4).[3] Sophie Desrosiers believes this fabric is the earliest known example of the use of complementary wefts (December 2012, personal communication). It should be noted that the cords associated with Baton 1 are wrapped with the same colours as are found in the camelid-hair yarns of the fabric (bracken, red earth, and golden-yellow).

Individual wrapped cords and cord groups

There are six individual wrapped cords, which consist of both complete cords and pieces of cords (Figure 2–5). All individual wrapped cords were found inside a flat-bottom, bowl-shaped basket, approximately 10–13 cm tall and 32 cm in diameter (Figure 2–6). Its structure, following the classification scheme developed by James Adovasio (1977), is close simple twining with Z-twist wefts and paired rigid warps. It has a centre with warp elements layered in sets of eight, and it has simple selvedges where the warps are inserted into different warp rows – three warps ahead and three warps back – with warp splices incorporated into pre-existing weft crossings. Wefts come in three colours, blue, red, and natural, that create solid weft bands as well as bands of two-colour (blue and natural) complementary wefts that produced both banded and chequered patterns.

An individual cord group is a set of cords that are not attached to a baton but which share a wrapping pattern and were found together. There are five individual wrapped-cord groups, two of which were found in the previously described basket (Figures 2–7(a) and (b)). Two other cord groups were found in a textile-wrapped bundle that also contained balls of yarn, a spindle whorl, and a comb-like object, which is probably not a comb, because its tines are much coarser than those of actual combs, and it is weighted with stones, which makes it too heavy to use as a comb. A similar object was illustrated by Engel (1976: 155). The two cord groups were wedged in the wooden tines of the comb-like object (Figure 2–8). One of the cord groups attached to the comb-like object was unfinished, suggesting that this object might have been involved in making them.

Remnants of a fifth cord group were found in a textile-wrapped bundle that also contained a smashed *olla*, shells, peppers, sulphur-yellow coloured stones, and *pallares*, a type of bi-coloured bean discussed later in the chapter. The cord group was tightly wrapped around the remnants of a textile that was also inside the bundle (Figure 2–9). Beans were still adhering to the folds of this textile, suggesting is might have been a bag that held the beans, and the cords were used to tie it shut. This cord set has the same colours and wrapping patterns as the cords associated with Baton 1, which was discussed earlier (Figure 2–7(a) and (c)). Engel depicts a plain-weave bag from the Paracas site of Aldea with warp stripes and weft bands which is tied shut with a pattern-wrapped cord that looks like those found at Cerrillos (Engel *et al.* 1991: fig. 68).

Figure 2–4. Baton group 1.
(Source: Museo Regional de Ica, 2003-L921A. Author's photographs.)

Baton-cord groups

Baton-cord groups are attached to, or found with, wrapped batons. There are six such groups (Figure 2–10). Two cord groups have become detached from their batons, probably due to the brittle condition of the batons' wrapping cords. One of these groups was found in the basket mentioned above.

Cord construction

I believe that most, if not all, cords hung at one time from a primary cord. Based on extant cord groups, I believe that each primary cord had from three to five cords, which begin as braids, then split into two spiral-wrapped (also called helically wrapped) segments that terminate in fringes. Some cords, as seen in two surviving cord groups (Figures 2–7(b) and (c)), are twice the length of other cords, and they have two wrapped segments with fringes at both ends. Figure 2–11 provides a diagram of an individual and a double cord. Unlike 'single' cords, double cords are not attached to primary cords and were probably doubled or folded around the primary cord as a means of attachment.

Primary cords

Primary cords are, or were, attached to batons with spiral wrapping, which is described below.

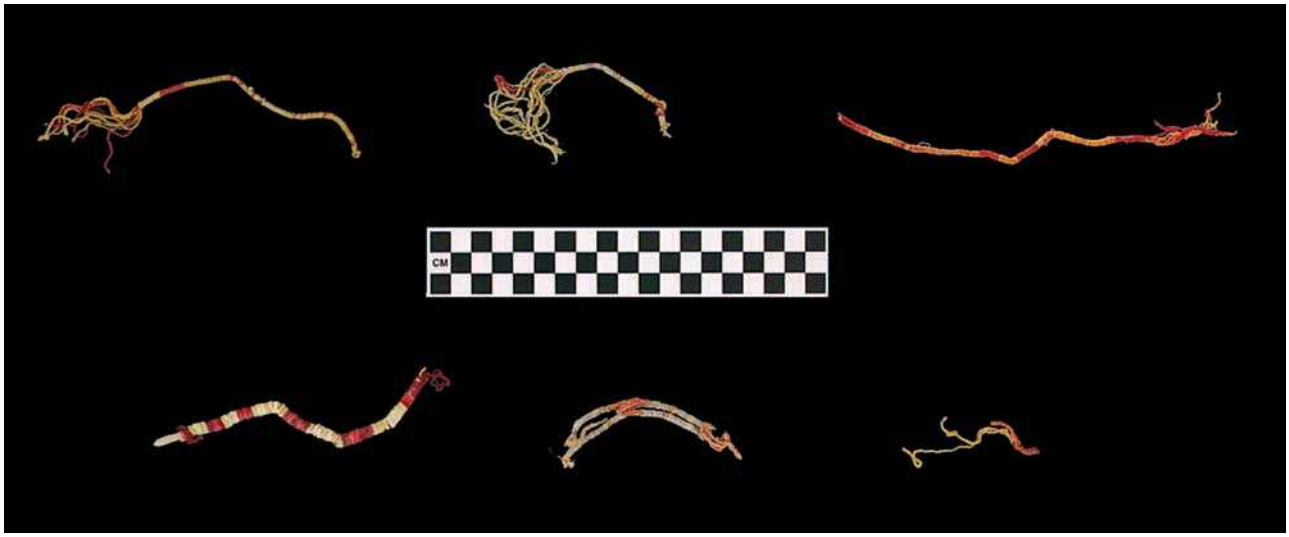


Figure 2–5. Individual wrapped cords from basket individual wrapped-cord groups.
(Source: Museo Regional de Ica, 2003-L912B. Author's photographs.)

Figure 2–6. Basket: (a) containing individual wrapped cords and Baton group 7; (b) bottom of basket showing complementary-weft patterning.
(Source: Museo Regional de Ica, 2003-L912B. Author's photographs.)

Because they were pressed against the wood of the baton, which is acidic, primary cords rarely survived. As a result, there are three surviving primary cords, two of which are red camelid-hair yarns with either an I(2s(2z)) or Z(2s(2z)) structure.[4] The other primary cord is a white, cotton,[5] S(2z(2s(2z))) yarn that can be clearly seen in Figure 2–12.

Braiding

Each wrapped cord has a braid made of six, eight, or ten strands, usually eight, which are obliquely interworked over-one-under-one (1/1) with S(2z) camelid-hair yarns. In each braid, half the strands spiral Z and interwork the yarns that spiral S (Figure 2–13), and this is true of all square braids. Each braid consists of three or four colours, one of which is always dark-red. Braiding extends 8–10 cm, at which point the braiding yarns divide into two segments that serve as cores for spiral wrapping (Figure 2–14).

Cord wrapping

At the end of each braid, the yarns divide into two cores, each of which is spiral wrapped. Changes in colour, shade, and yarn structure were made by either: (1) introducing a new yarn, or (2) by pulling a yarn from the core (see Figure 2–14), and the retiring yarn was added to the core. The point of transition, where the new wrapping yarn passed over the retiring yarn, created a cross that has a slant of either S or Z. Most cords have a Z spiral,

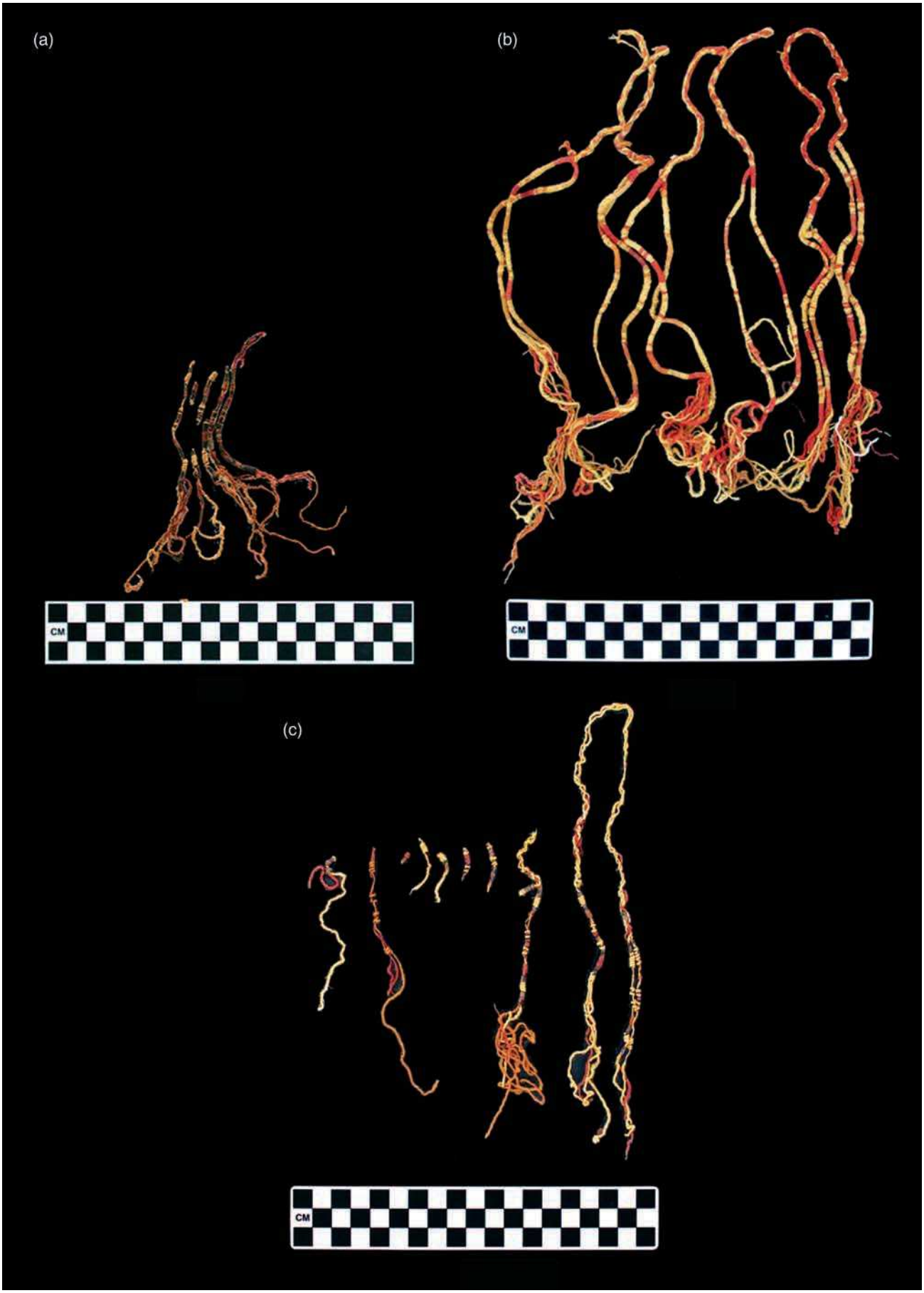


Figure 2–7. Wrapped-cord groups: (a) Cord group 11 from basket; (b) Cord group 12 from basket; (c) Cord group 1 from Baton 1.

(Source: Museo Regional de Ica; (a) Cord group 11, 2003-L912B; (b) Cord group 12, 2003-L912B; (c) Cord group 1, 2003-L921A. Author's photographs.)

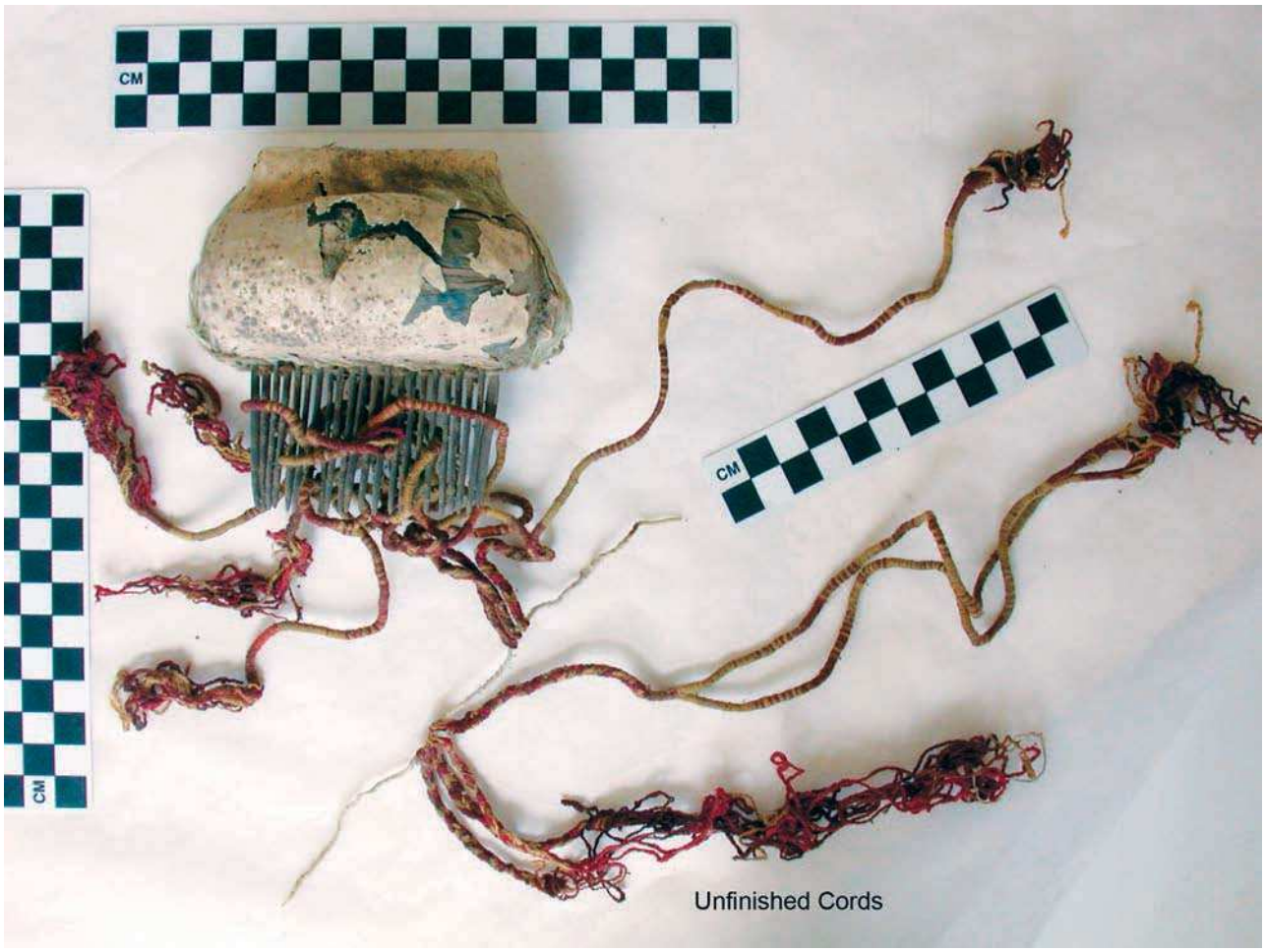


Figure 2–8. Comb group.
(Source: Museo Regional de Ica, 2003-L1143. Author's photograph.)

although two (Cord 8 and Cord Set 7) have S spiralling (Figure 2–15).

After the last band was finished, cord wrapping was terminated with one or two half hitches (Figure 2–16), and the remaining unworked yarns that formed the core became a multicoloured fringe. It should be noted that wrapping yarns, and only wrapping yarns, were used to tie the half hitches. Sometimes these knots were made with several, multicoloured yarns, giving the finishing knots the appearance of a variegated wrapping band, which will be discussed later. Most half hitches, both single and double, have an S-cross, although at least one has a Z-overhand knot.

Fringes

Fringes are the most colourful part of a wrapped cord (Figure 2–17). Comprising up to a third of the cord's total length, they consist of the remnants of both wrapping and braiding yarns. The importance of fringes is discussed later in the chapter.

Attaching cord groups to batons and/or baton wrapping

Wrapped-cord groups were attached to batons by placing the cord group's primary cord on the baton (and parallel to it) near its pointed end, after which the primary cord was bound to the baton with spiral wrapping (Figure 2–18). Like cord wrapping, several colours were used to wrap the batons, and colours were changed by pulling them from, and returning them to, a group of yarns that travelled under the wrapping. When wrapping was finished, the yarns that formed the core were knotted in half hitches (Figure 2–19). As in cord wrapping, baton wrapping usually has a Z-cross.

Bands

Bands come in wide and medium widths, which I will define. However, it should be noted that band dimensions are relative, differing from one baton, cord, and cord group to another, and a medium band on one cord might be a wide band on another. That said, medium bands on both batons and cords

Figure 2–9. Bean bag group.
(Source: Museo Regional de Ica. Author's photograph.)

are one colour. Medium bands on batons are about 0.5–0.75 cm wide and have a count of 6–10 wraps with a two-ply yarn (double for single-ply yarns). Medium bands on wrapped cords are typically 0.75–1.75 cm wide and have 8–15 wraps with two-ply yarns, double for single-ply yarns.

Wide bands on batons are about 1.5 to 2 cm and have a count of 12–20 (or more) wraps using two-ply yarns (double for Z or S yarns). Wide bands on wrapped cords are about 1–1.5 cm and have about 17–25 (up to 38) wraps with two-ply yarns, doubled for single-ply yarns. Wide bands come in two types: solid and variegated, where variegated bands on both batons and cords are slightly wider than non-variegated wide bands, and they usually consist of 9–11 thin bands (but there can be as many as 20 or more), each of which has 1–3 wraps (usually two) using two-ply yarns (double for single-ply yarns), and are typically 0.15–0.3 cm wide. Variegated bands essentially have miniature patterns that use the same yarns but not the same sequence as the larger pattern made of solid bands. The incorporation of miniature band patterns within the structure of the whole seems to be an example of 'synecdoche', a figure of speech in which the part stands for the whole. Allen argues that 'synecdochal thinking', where mutually enveloping homologous structures act upon each other, is a prominent feature of Andean cultures (Allen 1997: 81). Other authors argue that synecdoche is especially prominent in Andean weaving practices, where complex designs are reduced to manageable scales through nested and ranked symmetrical operations (see for example E. Franquemont 2004; Franquemont and Franquemont 2004: 184).

Band patterns

Wrapped bands have multiple attributes that include band width (thick and medium), band type (solid or variegated), colour (typically three to seven colours[6]), final twist (S versus Z), and ply (single-ply and two-ply). Band patterns have line (mirror) reflection about a single point (band) (for a discussion of mirror symmetry, see Washburn and Crowe 1988: 46). For example, Baton 4 is wrapped with a pattern, where natural, single-ply yarns alternate

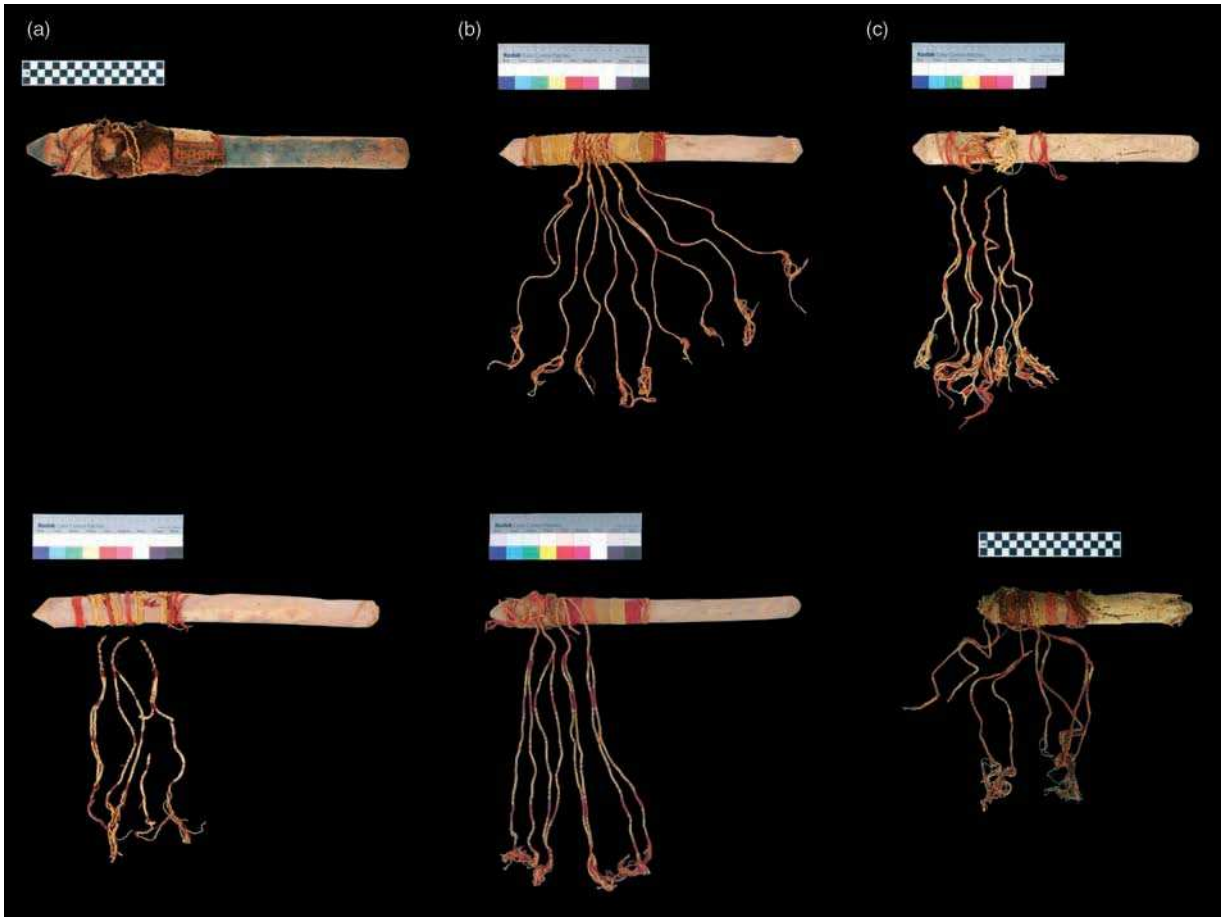


Figure 2–10. Baton-cord groups: (a) Cord group 11 from basket; (b) Cord group 12 from basket; (c) Cord group 1 from Baton 1.

(Source: Museo Regional de Ica. Top row, left to right: Group 1, 2003-L921A; Group 4, 2003-L921D; Group 6, 2003-L1032. Bottom row: Group 3, 2003-L921C; Group 5, 2003-L921E; Group 7, 2003-L912B. Author's photographs.)

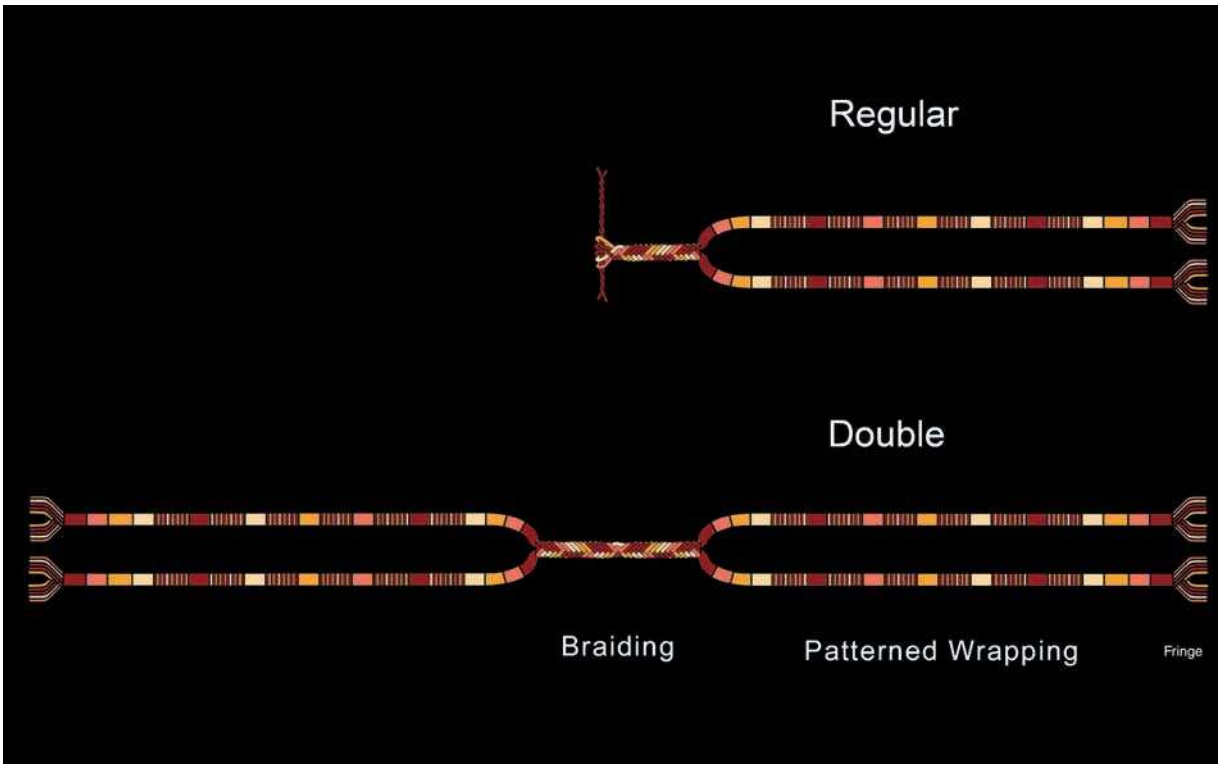


Figure 2–11. Cord diagram of single cord and double cord.

(Source: Author's drawing.)

Figure 2–12. Diagram of an eight-strand square braid demonstrating its spiral structure.
(Source: Author's drawing.)

with dyed, two-ply yarns, and the dyed yarns create a separate pattern where golden-tan and golden-brown alternate with red (Figure 2–20).

Sometimes the symmetry is interrupted by substitutions, deletions, additions, reversals, etc. For example, Baton 5 has symmetry only if we consider substitutions in attributes involving colour, ply, and whether it is natural or dyed (Figure 2–21). Substitutions and other interruptions are particularly common in variegated bands in cords. The coloured band patterns (or what is left) of all six batons are presented in Figure 2–22.

Band type, direction (final twist and ply), and colour (including shade, whether bright/dull, and distinctions between natural and dyed yarns) each form different patterns of symmetry independently of one another (Figure 2–23). The layers of patterning are akin to the changing images of a rock that consists of multiple minerals when viewed under visible, ultraviolet, and infrared light sources. Multiple layers of patterning are found in Necropolis embroidered fabrics, which have been studied by Cora Stafford (1941), Anne Paul (2001), and Mary Frame (2001a), where the independent attributes include orientation, form, colour, and number of figures that either border the edge of a fabric or cover it in a grid-like pattern.

Anne Paul suggested that the patterns found in imagery, colour, orientation, and symmetry in Paracas Necropolis embroideries had meaning (Paul 1986a and 1986b, 1992, 2001, 2004). Mary Frame independently came to similar conclusions about symmetry patterns (Frame 1986, 1988, 1991) but has since proposed an alternative approach to that of Paul (2004) regarding the symmetry patterns in the Paracas Necropolis embroideries (Frame 2004, 2009, n.d.). Furthermore, Mary Frame has shown that the orientations and colour patterns found in the spirals of step-frets in Wari tapestry tunics reveal an iconic sign system depicting the wrapping patterns on Wari staffs (Frame 2006, in press).

The wrapping patterns in cords are more complex than in batons; cords have many more bands, including more variegated bands, which repeat two to six times along the length of a cord. The band patterns of several cords and cord groups are illustrated in Figure 2–24, and several variegated band patterns

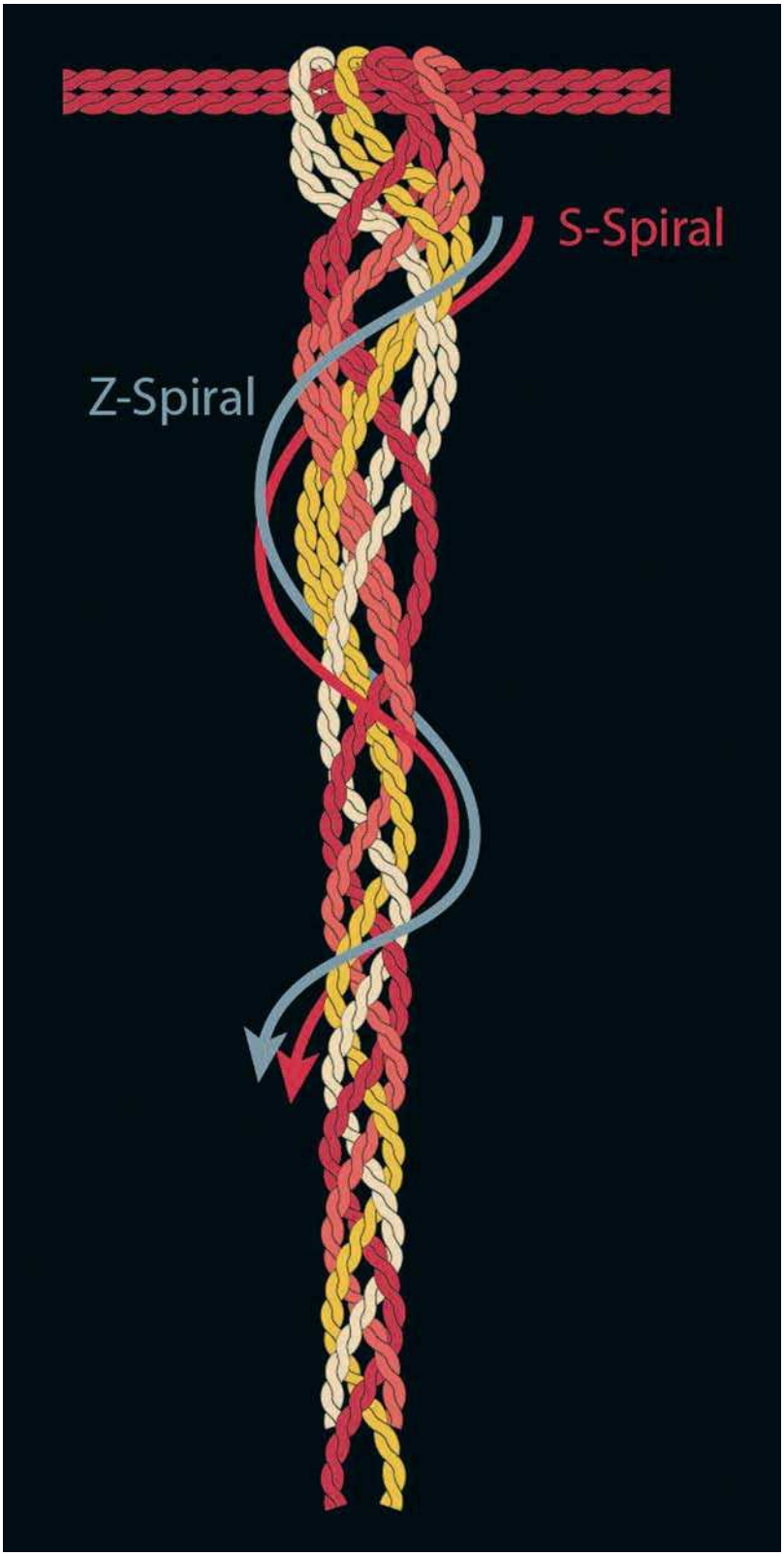


Figure 2–13. Primary cord with cord groups attached to the weighted 'comb'.
(Source: Museo Regional de Ica, 2003-L1143. Author's photograph.)

are illustrated in Figure 2–25. Variegated bands in cords are more likely than solid bands to have interruptions in their symmetry involving reversals, omissions, additions, and substitutions involving colour (for example red substituting with gold), shade (red interchanging with pink or auburn; gold substituting with tan, etc.), 'state' (natural versus dyed), final twist, and ply. For example, in the variegated band shown in Figure 2–26(a), all the yarns are S(2z), but red substitutes with dyed golden-yellow, and natural brown substitutes with dyed auburn. In Figure 2–26(b), red Z bands substitute with red S(2z)

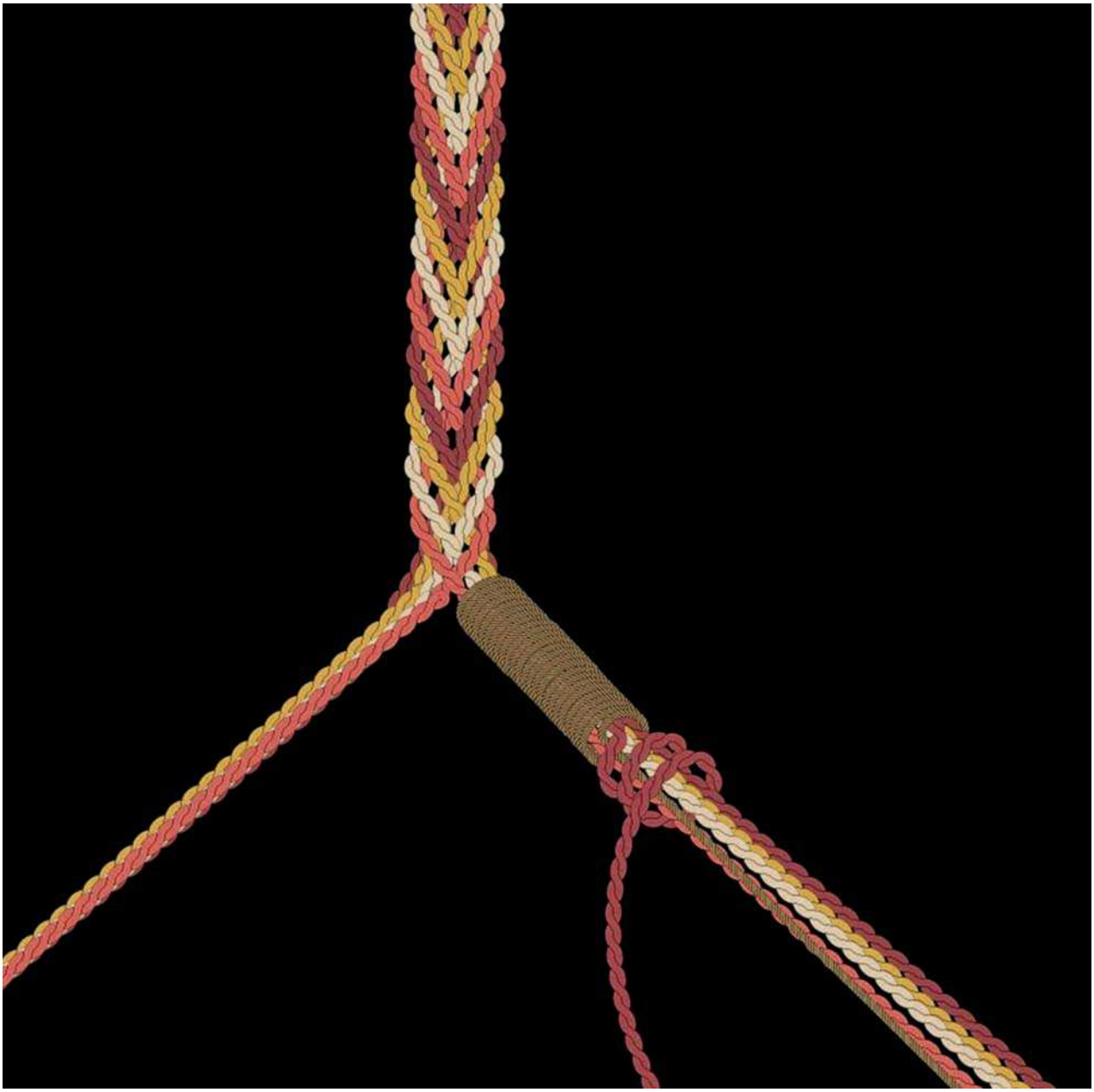


Figure 2–14. Separation of braiding yarns and the start of spiral wrapping.
(Source: Author's drawing.)

bands; dyed, golden-tan, S(2z) bands substitute with natural, tan, S(2z) bands; an extra natural, tan, S(2z) band is added to the cord on the left; and an extra dyed, golden-tan, S(2z) band is added to the cord on the right. Such substitutions are not uncommon.

In summary, batons and cords were wrapped in such a way as to create multiple layers of patterning using attributes that frequently involve a choice between binary oppositions, including band width (medium, wide), band type (solid, variegated), shade (dark, light), state (dyed, natural), final twist (S, Z), and ply (single, two), where each variable is independent of the others.

It should be noted that two individual wrapped cords – Cords 8 and 9, both of which came from the Basket group – do not conform to the patterns of symmetry noted above (Figure 2–27). They lack the variegated bands typical of Cerrillos wrapped cords, and their colours, yarn structures, and symmetry patterns differ enough to suggest that they were not made by the same people and/or at the same location as the other wrapped cords. One of them, Cord 8, has a reed core, which is unique within the collection and resembles the wrapped cords excavated by Kroeber from Cerro del Oro (Kroeber 1937: pl. 90, fig. 92). Reiss and Stübel (1998 [1880–1887]: pl. 32; figs. 5–7, 8–10) depict similar wrapped-reed objects from Ancon that date from the Late Intermediate Period to the Late Horizon (see also Kaulicke 1997: fig. 76). Perhaps Cord 8 is

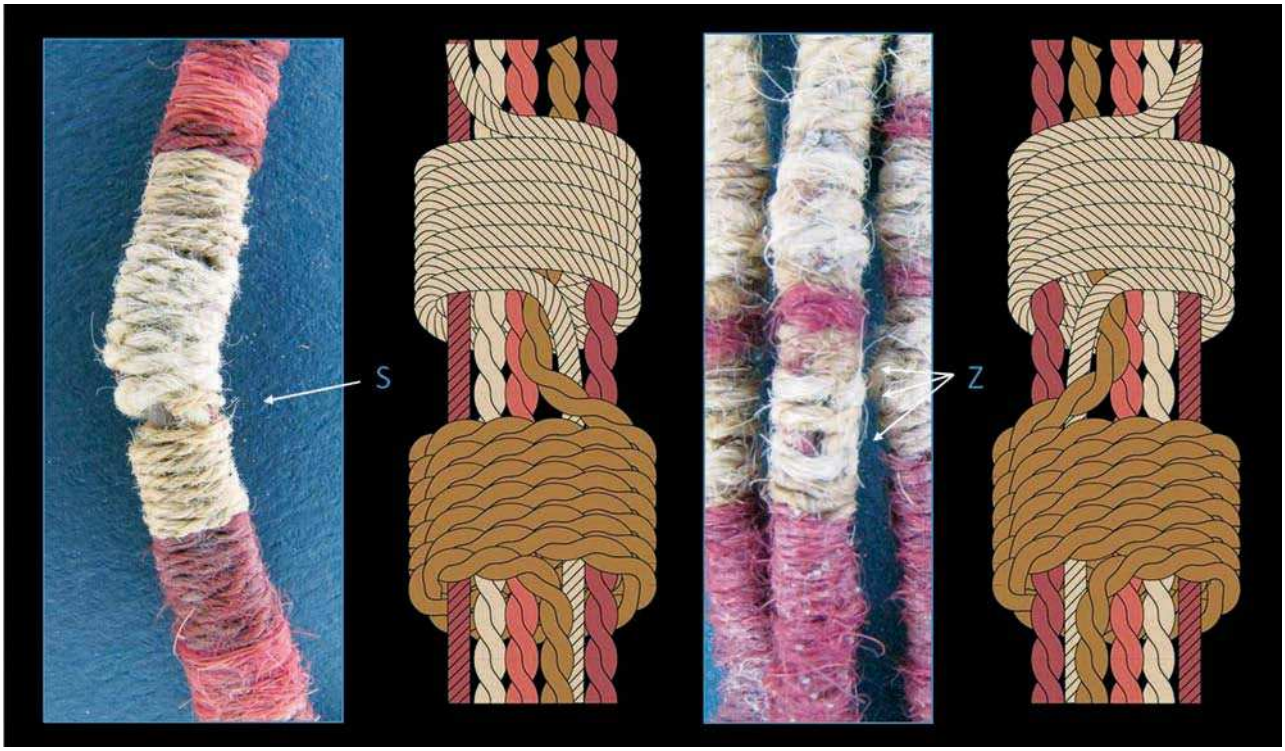


Figure 2–15. Diagram of twist direction. Left: Cord 8, which has an S slant; right: cords from group which have a Z slant. (Source: Museo Regional de Ica. Cord 8, 2003-L912B; Cord group 4, 2003-L921D. Author's photographs and drawings.)

a *musa waraña*, a device used by weavers discussed later in the chapter.

Archaeological analogy

What are these objects? What were they used for? How were they used and by whom? The present study seeks to shed light on these questions through a three-phased approach, using archaeological analogy to gain insight into their cultural context, ethnographic analogy to understand the importance of spirals and wrapping, and visual semiotics to understand the significance of band patterns. All of these aspects must be considered to develop a coherent theory regarding the nature of the Cerrillos wrapped batons and cords.

Archaeological analogy attempts to understand objects by studying the contexts and associations of similar objects – formally, iconographically, and structurally – from the same region and time period. We begin with a comparison of baton-like objects, starting with staffs, which differ from batons in their length, as staffs are typically chest-high or longer. Painted representations of staffs are found on Early Paracas cotton textiles from Karwa (see for example Cordy-Collins 1976, 1979, and Small 2001) and Zamanca-Huyujulla (Cordy-Collins 1999: 131, pl. 139), and in at least one depiction of the Staff God from Karwa the staffs are banded (Cordy-Collins 1999: 133, pl. 110).

Clubs form another group of baton-like objects. Clubs differ from batons, as clubs are heavier and usually wrapped with uncoloured bands of sinew (Rickenbach 1999: 56, fig. 64); Cerrillos batons, in contrast, are too light for use in battle. Clubs are archaeologically associated with male Necropolis mummy bundles (Tello 1959: lam. XXIV). Signal staffs form another group, which are longer and thinner than batons. Signal staffs are wrapped with coloured and/or raw cotton yarns at one end. They are often found in Necropolis burials, such as Burial 113, now in the American Museum of Natural History (Ann Peters, personal communication 2012; see also Tello 1959: lam. XI; Tello and Mejla Xesspe 1979: 333, fig. 91).

Actual batons are rare in the archaeological record. An example of a miniature baton was encountered associated with an Early Nasca gold figurine in the Museum of Fine Arts, Houston. It is held by a seated figure and is wrapped with multicoloured yarns (Marzio 2007: 30), exactly like a Cerrillos wrapped baton. Further study of this figurine is needed. Woven depictions of batons with coloured bands are found at Cerrillos (Splitstoser *et al.* 2010: figs. 9–11; Figure 2–28 here).

Depictions of colourfully banded (or wrapped) baton-like objects are ubiquitous in Necropolis

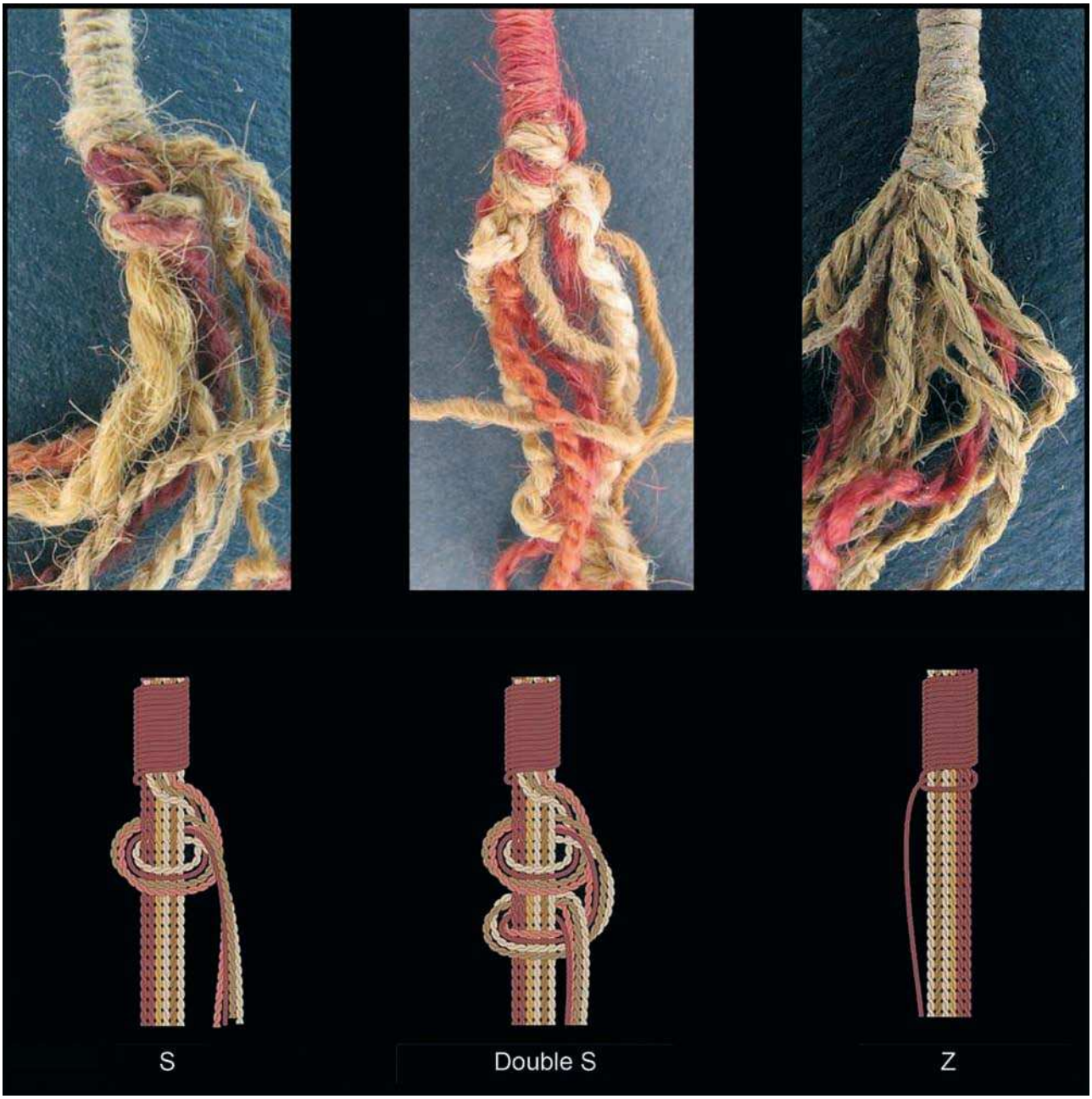


Figure 2–16. Diagram of fringe knots showing examples of S, double-S, and Z knots.

(Source: Museo Regional de Ica. Top row, left to right: Cord set 4, 2003-L921D; Cord set 5, 2003-L921E; Cord 14, 2003-L912B. Author's photographs and drawings.)

embroideries, where they are frequently associated with figures holding severed heads. Anne Paul notes: 'decapitated human heads are everywhere in Paracas art' and are commonly found 'hanging from staffs' (Paul 1990a: 89); see also Von Hagen and Morris (1998: 104, fig. 171).[7] In an embroidered band from the Cabildo grave lot in Cahuachi, for example, colourful heads are depicted attached to colourfully wrapped batons by the hair, and surrounding figures hold wrapped batons which resemble those found at Cerrillos (Sawyer 1997: 79, 84–86, 89, figs. 56, 61–63); also see Makowski (2000: 294, fig. 246c).

There are similar versions of this theme on Early Nasca ceramics. For instance, on a cup from the Museum für Völkerkunde, Berlin (Proulx 2001: 127, figs. 126–129; Rickenbach 1999: 324, fig. 164), there are two scenes: the first depicts the defeat of an individual; and the subsequent scene depicts the transfer of presumably the same person's head on to a club by wrapping it with his hair (see also Rickenbach 1999: 344, fig. 197; Sawyer 1997: 162, pls. 142, 143).

Figures holding batons in Necropolis and Early Nasca embroidered textiles frequently also hold slings and/or fans (Benson and Conklin 1981: dust

Figure 2–17. A fringe.
(Source: Museo Regional de Ica, Cord set 5, 2003-L921E. Author's photograph.)

jacket; Frame 2001b: fig. 4.10c; Sawyer 1997: 50, pl. 23), suggesting they were conceptually related. These objects are also commonly found together in Necropolis mummy bundles. It seems as though this conceptual relationship was not limited to the Paracas region; Peter Fuchs depicts a front-faced contemporary figure from the Casma Valley holding a baton in one hand and what might be a sling in the other (Fuchs *et al.* 2009: figs. 18–19).

Both Late Paracas and Necropolis slings and fans share structural similarities. For instance, Paracas slings are braided (Splitstoser 2009: 805; see also Yacovleff 1933: 147, fig. 143b; Yacovleff and Muelle 1934: 113, fig. 114). Fans are also made of braided strands; the feathers are often affixed to the braids with spiral wrapping (D'Harcourt 1962: pl. 116; Reid 2005: 322, pl. 123; Rickenbach 1999: 251, fig. 268; Yacovleff 1933).

Slings are strongly associated with the head. For instance, slings were 'stored' wrapped around the head, and they are found archaeologically in head-dresses of mummy bundles, and they are depicted worn around the head in Early Nasca art (Purin 1990: 118, fig. 146; Rickenbach 1999: 317, fig. 156). Nasca ceramics frequently depict colourful heads (with equally colourful hair) hanging from slings (see Rickenbach 1999: 325, 326, 331, figs. 165, 166, 172)[8] around the rims and bottoms of cups and bowls.

A sling in the National Museum of Natural History, in Washington, DC (NMNH No. 301038) has a tassel made of dark-brown camelid hair (which looks

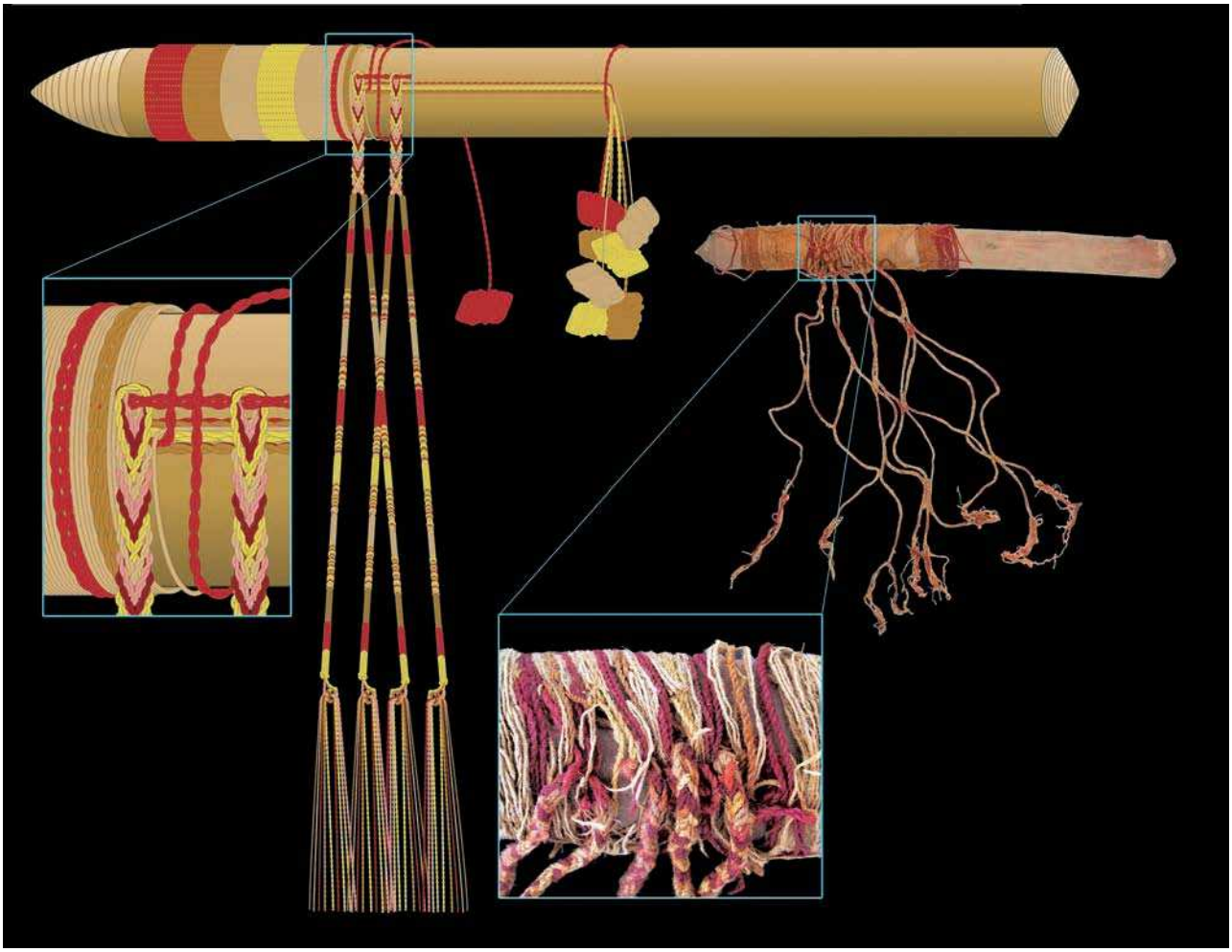


Figure 2–18. Methods of attaching a heading cord to a baton using Baton 4 as an example.
Note: the diagram's wrapping direction is in error; wrapping proceeded from the pointed end of the baton and worked toward the centre; the primary cord should also have five cords attached to it.
(Source: Museo Regional de Ica, 2003-L921D. Author's photographs and drawings.)

like human hair) and braids that are wrapped with colourful camelid-hair yarns that closely resemble the Cerrillos wrapped cords (Means 1920: pl. 22, fig. 21).[9] This wrapped-cord tassel seems to substitute for the heads that hang from slings depicted on Early Nasca ceramics noted above.

Another group of archaeological objects has an unmistakable structural resemblance to Cerrillos wrapped batons and cords; they are headdresses consisting of a looped cap to which are attached strands of human hair that are braided and wrapped leaving long fringes. Examples of these looped-cap-wigs abound (Rickenbach 1999: 250, fig. 266; Stone-Miller 1992: 122, pl. 133). None have secure provenance, but they are generally thought to have been made from Early Nasca to Wari times.[10]

In a final example, Mary Frame (1991: 128, fig. 4.13) published a Necropolis headdress from a Necropolis mummy in the Museo Nacional de Antropología, Arqueología e Historia (del Perú), Lima (91–31), consisting of numerous hanks of human hair wrapped with colourful yarns that make bands like those in Cerrillos wrapped batons and cords. Some hanks have diagonal wrapping as in Middle Horizon *khipu*, and there are two braids to which are attached woven tabs, each depicting a frontal face, a subject I will return to later.

Archaeological analogy usually limits itself to objects from roughly the same time period as the objects under investigation. However, the objects that most closely resemble the Cerrillos wrapped batons and cords are *musa waraña*, and Inka and Middle Horizon *khipu*, which date from the Middle Horizon to Late Colonial times. *Musa waraña*, also called 'heddle samplers', are devices that weavers use to remember complex warp colour patterns (Arnold and Espejo 2012). They consist of one or more sticks wrapped with bands of coloured yarns that represent warp patterns.

Denise Arnold and Elvira Espejo encountered their use in the Aymara-speaking *ayllu* of Qaqachaka (Abaroa province, Oruro department, Bolivia), where

Figure 2–19. S-knot terminating wrapping of Baton 5.
(Source: Museo Regional de Ica, 2003-L921E. Author's photograph.)

the colour combinations in the *musa waraña* are regionally determined and can be linked to individual family lines (Arnold and Espejo 2012: 180–181). Ann Pollard Rowe encountered their use in Quero, Tungurahua province, Ecuador (Rowe 2007: 22, 24, fig. 21.12). Lynn Meisch encountered their use in San Ignacio de Loyola[11] in the Department of La Libertad, Peru. Meisch notes:

> Women in San Ignacio keep samplers of the heddle-controlled motifs to facilitate putting the heddles on the loom, but once the laborious handpicking of the motif is complete and the heddles are in place, the weaving goes very quickly. (Meisch 2012)

The widespread distribution of *musa waraña* suggest that they might have a prehispanic origin, since there is no tradition of their use in Europe,[12] and *musa waraña*-like objects have been excavated from Late Intermediate Period tombs at Ancon (Arnold and Espejo 2012: 193–196; Kaulicke 1997: fig. 25; Reiss and Stübel 1998 [1880–1887]: pl. 19). Arnold and Espejo note that 'similarly patterned objects (hair braids wrapped in coloured threads, cartouche-wrapped *khipu* pendant cords, Middle Horizon wigs with pendant braids wrapped in threads) might have served similar purposes' to *musa waraña* (Arnold and Espejo 2012: 178). As noted earlier, Cerrillos Cord 8 (Figure 2–27) resembles the wrapped-reed *musa-waraña*-like objects from Ancon depicted by Reiss and Stübel (1998 [1880–1887]: pl. 32; figs. 5–7, 8–10).

The formal and structural similarities between Cerrillos wrapped batons and cords, and *khipu* are most remarkable. All have primary and secondary cords that resemble fringes. Middle Horizon *khipu* have multicoloured yarns that form complex patterns with diagonal spiral wrapping. Inka *khipu* cords are coloured, mottled, and/or wrapped with coloured yarns (Arellano 1999: 234; Urton 2003). Martín de Murúa (2008 [1611–1616]: fol. 76v), a Spanish chronicler who likely witnessed the use of *khipu*, depicted in his book, *Historia general del Piru*, a *quipucamayo contador* (*khipu* accountant) holding a multicoloured *khipu* with yellow, tan, red, pink, and blue strings.

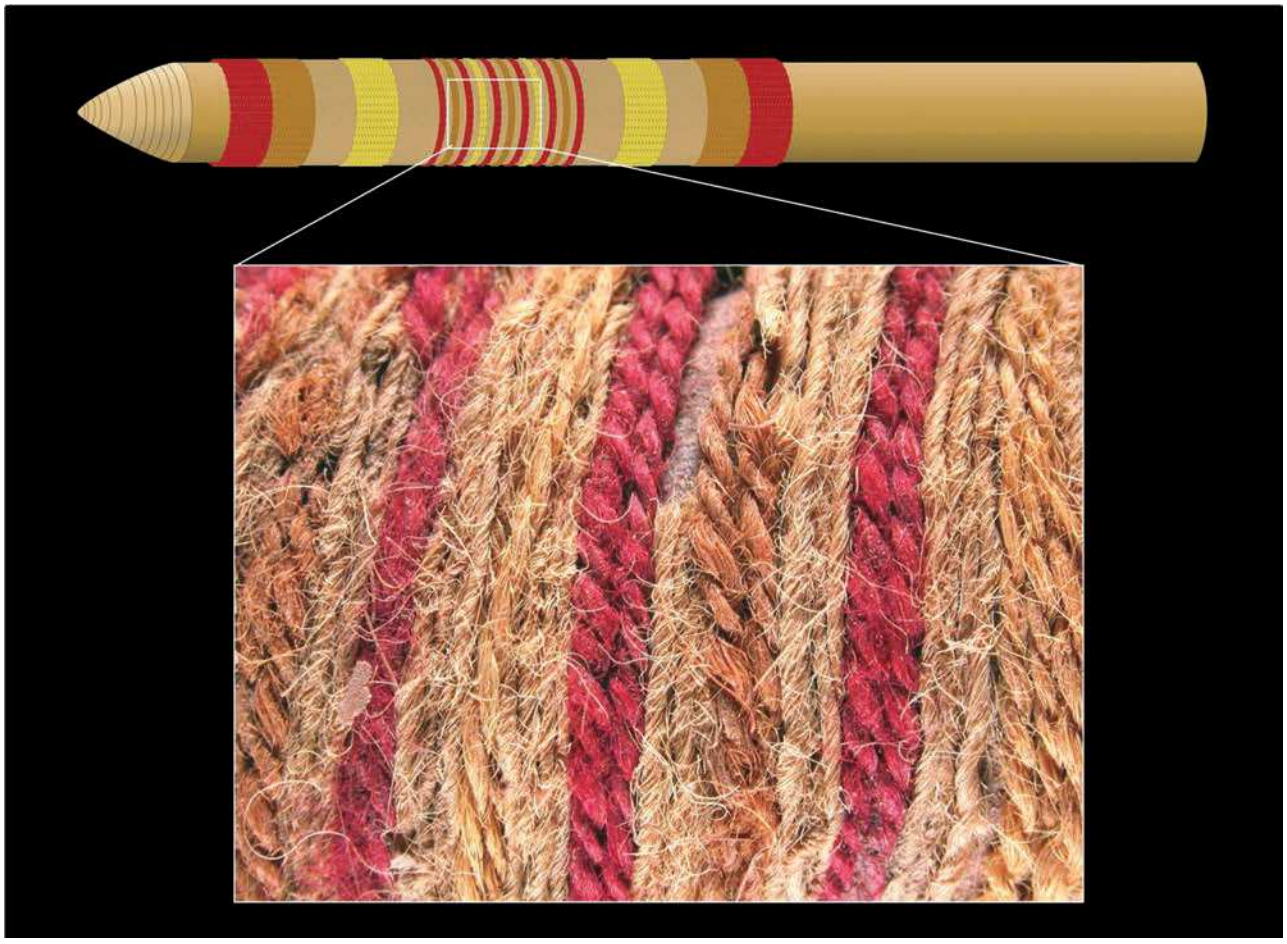


Figure 2–20. Baton wrapping showing pattern where bands of natural, single-ply yarns alternate with bands of dyed, two-ply yarns, and dyed red yarns alternate with dyed golden-tan and dyed golden-brown yarns.

(Source: Museo Regional de Ica; Baton 3, 2003-L921D. Author's photograph and drawing.)

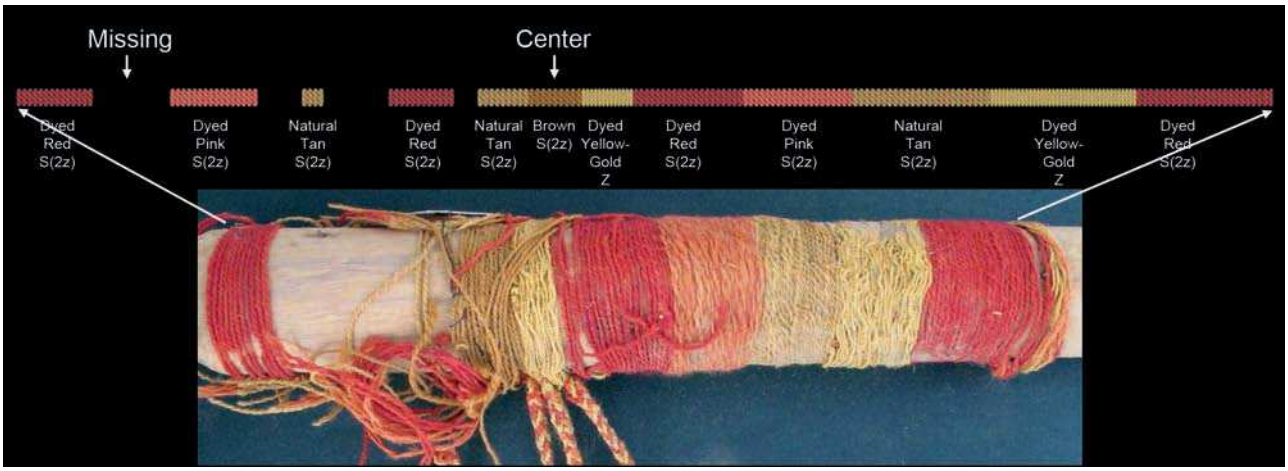


Figure 2–21. Diagram showing Baton 5's symmetry.

(Source: Museo Regional de Ica, 2003-L921E. Author's photograph and drawing.)

Like Cerrillos wrapped cords, which begin as braids that divide to form two wrapped cords, the wrapped cords of Middle Horizon *khipu* are often attached to braided primary cords (Conklin 1982: 269). Some Inka *khipu* primary cords are attached to wooden sticks (Arellano 1999: 226–227). Both Middle Horizon and Inka *khipu* were coiled up in a spiral when not in use (Arellano 1999: 224, 272; Conklin 1982: 264).

In addition, we know that *khipu* function on multiple levels, in a hierarchy. *Khipus* of upper levels summarise information from subunits of multiple *khipu* of lower levels. *Khipus* of equal hierarchy have similar, but not identical, numerical

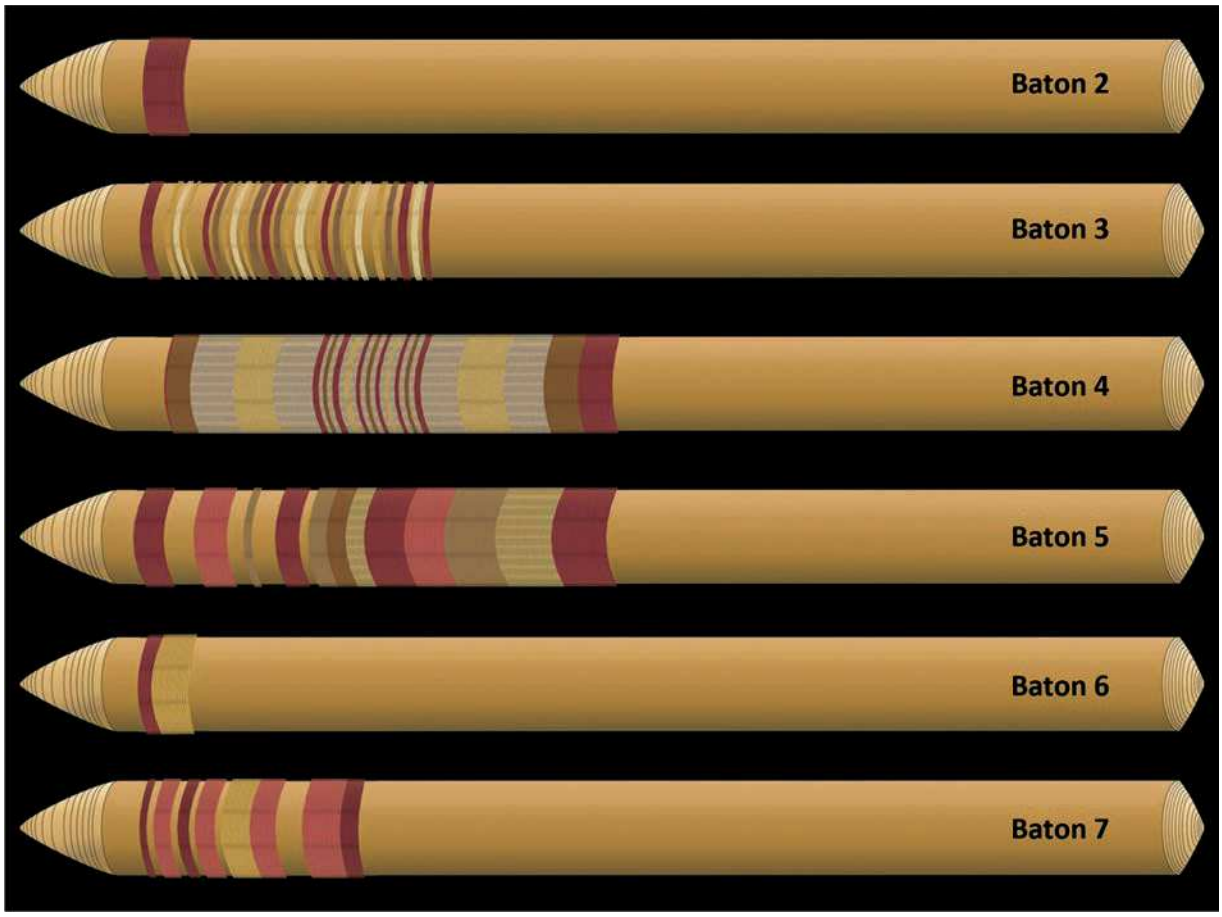


Figure 2–22. Diagram of coloured baton wrapping patterns.
(Source: Author's drawing.)

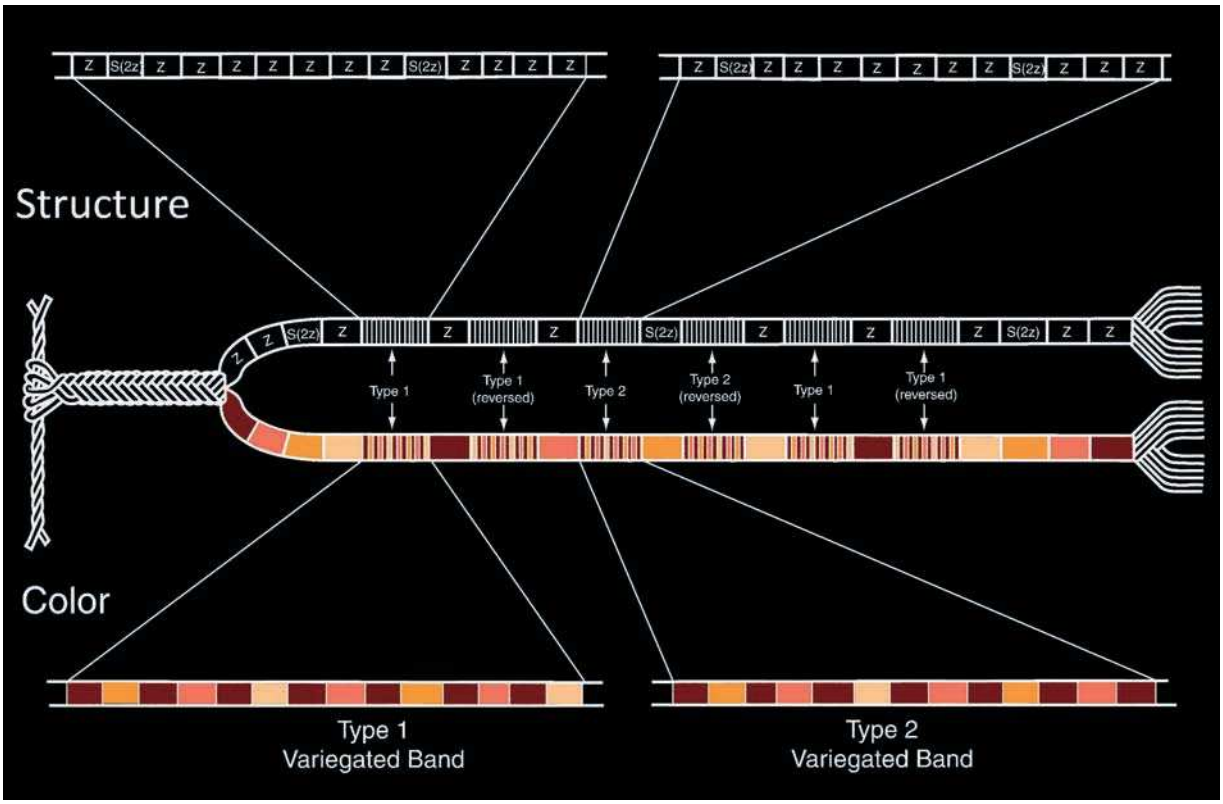


Figure 2–23. Diagram of cord wrapping, where band-colour patterns are highlighted in colour and the black and white areas demonstrate patterns involving ply or twist.
(Source: Author's drawing.)

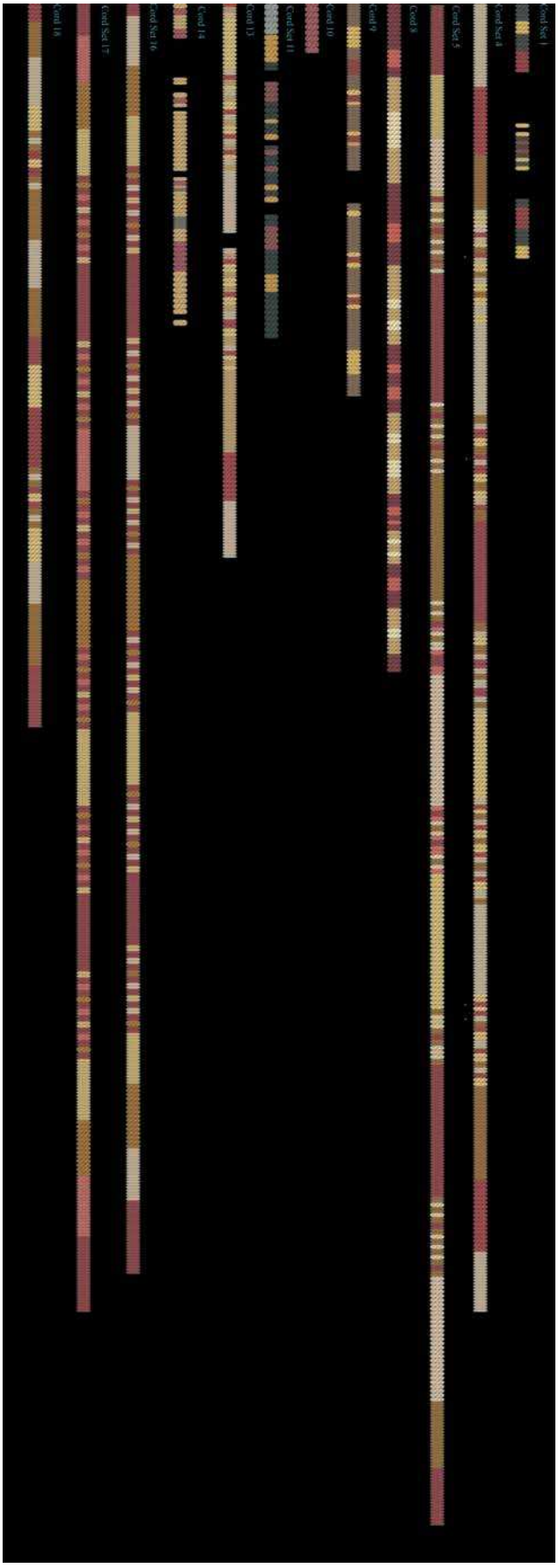


Figure 2–24. Diagram of band patterns of individual cords representing several individual cords and cord groups. From left to right they are: Cord 18, Cord set 17, Cord set 16, Cord 14, Cord 13, Cord set 11, Cord 10, Cord 9, Cord 8, Cord set 5, Cord set 4, Cord set 1.

(Source: Author's drawing.)

sequences and colouring. Each Inka *khipu* has one or more subunits, which are based on a sequence of cord/string colours and spacings, where generally four colours are repeated multiple times (Urton and Brezine 2005: 1065–1066). This hierarchical structure, with multiple subunits that are defined based on colour and spacing, is highly reminiscent of the structure of the Cerrillos wrapped cords, in which variegated bands defined by a sequence of attributes such as colour repeats are separated by sequences of wide bands. *Khipu* have 'introductory segments' (Urton and Brezine 2005: 1066), which, in the Cerrillos objects, might correspond with wrapped batons.

We know that Inka *khipu* (and *musa waraña*) were used as record-keeping devices, but we do not know if Middle Horizon *khipu* were similarly used. However, given their structural similarity to Inka *khipu*, it is reasonable to believe that Middle Horizon *khipu* conveyed information, although they probably operated differently from Inka *khipu*. Arnold and Espejo note that a certain type of *musa waraña* served as 'a *khipu*-like instrument … in the female domain of textile production' (Arnold and Espejo 2012: 184–185), where dye specialists kept records of requests from clients by knotting coloured threads. Given the structural resemblances between Cerrillos wrapped objects, *musa waraña*, and *khipus*, one wonders if the Cerrillos wrapped batons and cords might have encoded information, too. Were they precursors to *musa waraña* and/or *khipu*, 'proto-*khipu*', so to speak?

Significance of spiral wrapping

Previous discussion of band patterns demonstrated that the Cerrillos wrapped batons and wrapped cords were capable of storing information using multiple layers of band patterning. Formally and structurally, they most closely resemble *musa waraña* as well as Middle Horizon and Inka *khipu*, but if, like *khipu*, the Cerrillos objects recorded information, the coding was done with spiral wrapping, not knotting. Why use spiral wrapping when it would have been easier to produce similar looking band patterns through weaving, painting, or beading? Perhaps the process of wrapping itself embedded meaning. Maybe wrapping constituted an Andean *tekhnē*, a knowledgeable practice and practical knowledge (*in sensu* Ingold 1988), where ideas and philosophies about wrapping and spiral structures were enacted and created through spiral movements and practices. In this way, spiral wrapping might have

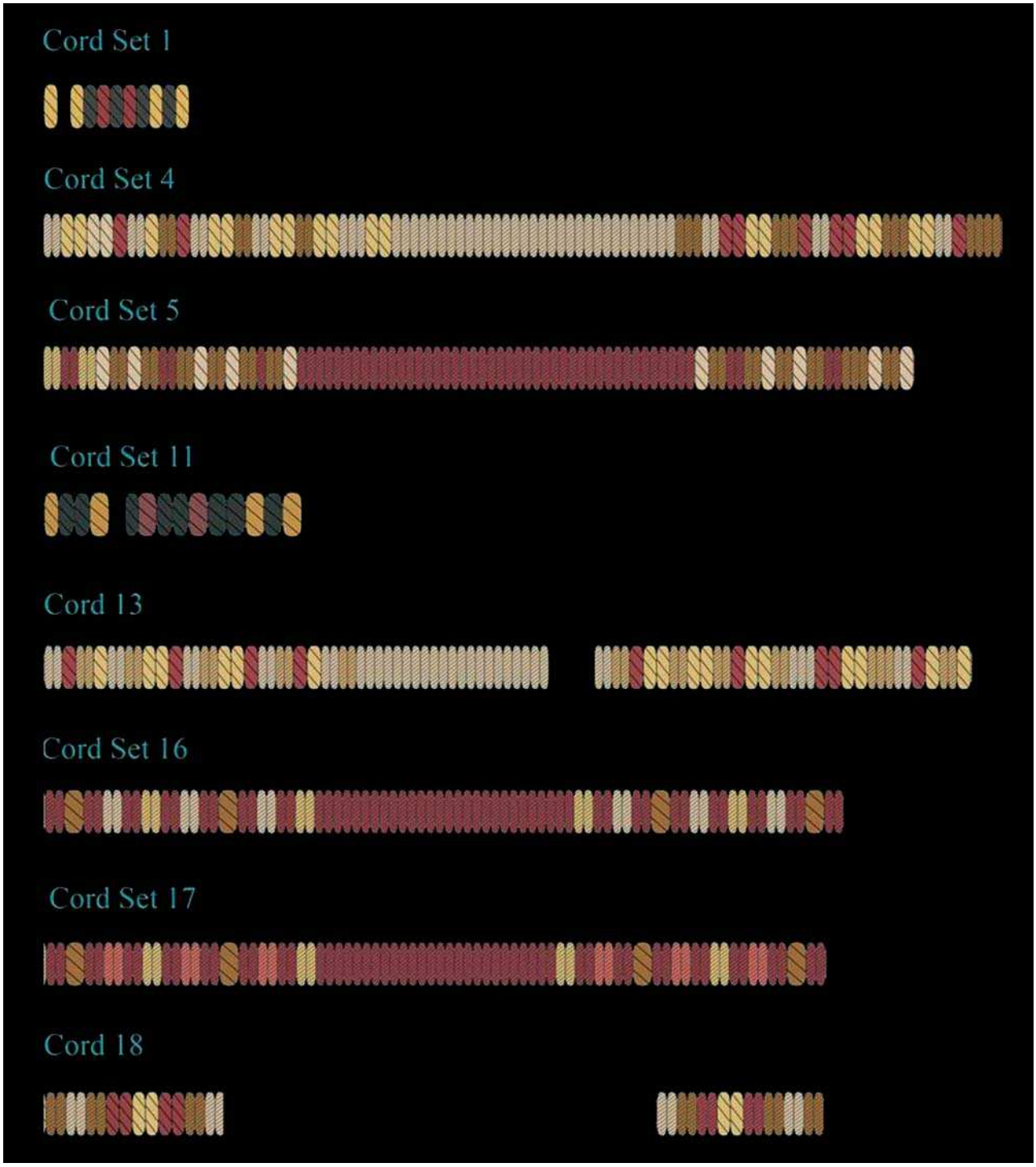


Figure 2–25. Diagram of variegated band patterns of individual cords representing several cords and cord groups. (Source: Author's drawing.)

been a transformational activity in which the act of wrapping itself made meaning.

Biomechanics of spiral wrapping

To test this hypothesis, this section examines the biomechanics of wrapping followed by a review of archaeological and ethnographic evidence to shed light on the importance of wrapping and spiral structures. Spiral wrapping involves circular body movements, in which a yarn encircles and envelops that which it wraps. During this process, the active, spiralling element binds one or more passive entities. At the same time, the wrapping element (be it a yarn or a cloth), covers that which is being wrapped, hiding, disguising, and changing its/their individual identity(ies) as, together, they are transformed into a single whole. Wrapping is thus a transformative practice; it is powerful.

Through the act of encircling another object(s), spiral wrapping creates a border, a perimeter. Borders delimit and define; they also protect. In this way, spiral wrapping is akin to bundling, which was

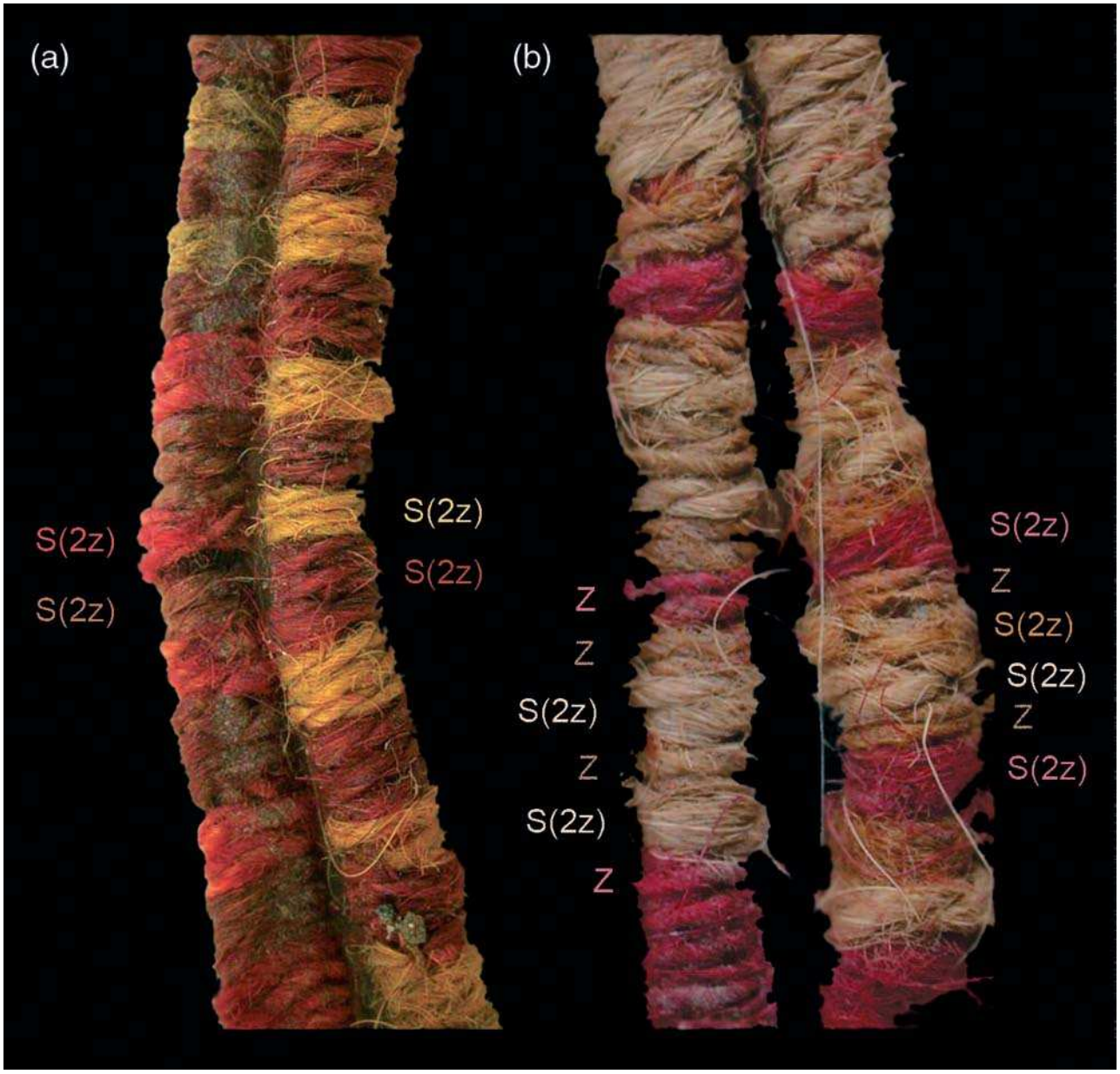


Figure 2–26. Typical colour substitutions: (a) dyed red substitutes with dyed golden-yellow, and natural brown substitutes with dyed auburn; (b) red Z substitutes with red S(2z), dyed golden-tan S(2z) substitutes with natural tan S(2z); an extra natural, tan, S(2z) yarn is added on the left; and an extra dyed, golden-tan S(2z) band is added to the yarn on the right.

(Source: Museo Regional de Ica. (a) Cord group 7, 2003-L912B; (b) Cord group 4, 2003-L921D. Author's photographs and drawing.)

considered a sacred act throughout the Americas. For instance, Julia Guernsey and F. Kent Reilly, III, describe the significance of wrapping and bundling in ancient Mesoamerica:

> A wrapped object was protected from profane handling or view. The act of wrapping not only veiled objects, monuments, and individuals, but also enhanced their sacredness through their concealment. Conversely, the unwrapping of a bundled object or monument was an act of discovery and disclosure … Conceptually and literally 'tied' into this was the material from which a bundle was constructed – cloth, bark paper, or other perishable textiles. These materials in and of themselves carried esoteric ritual information through woven, painted, or knotted patterns. (Guernsey and Reilly 2006: v)

Archaeological evidence for spiral wrapping

What archaeological evidence is there for the importance of wrapping and spiral structures? Spiral structures were often part of plain-weave warp selvedges during Early and Middle Paracas times, taking the form of one or two rows of simple weft twining (see also Splitstoser 2009: 307–308, and Wallace 1979), which is a structure where two wefts spiral around the warps. Fringes were applied to Karwa and Cerrillos fabrics by whip-stitching

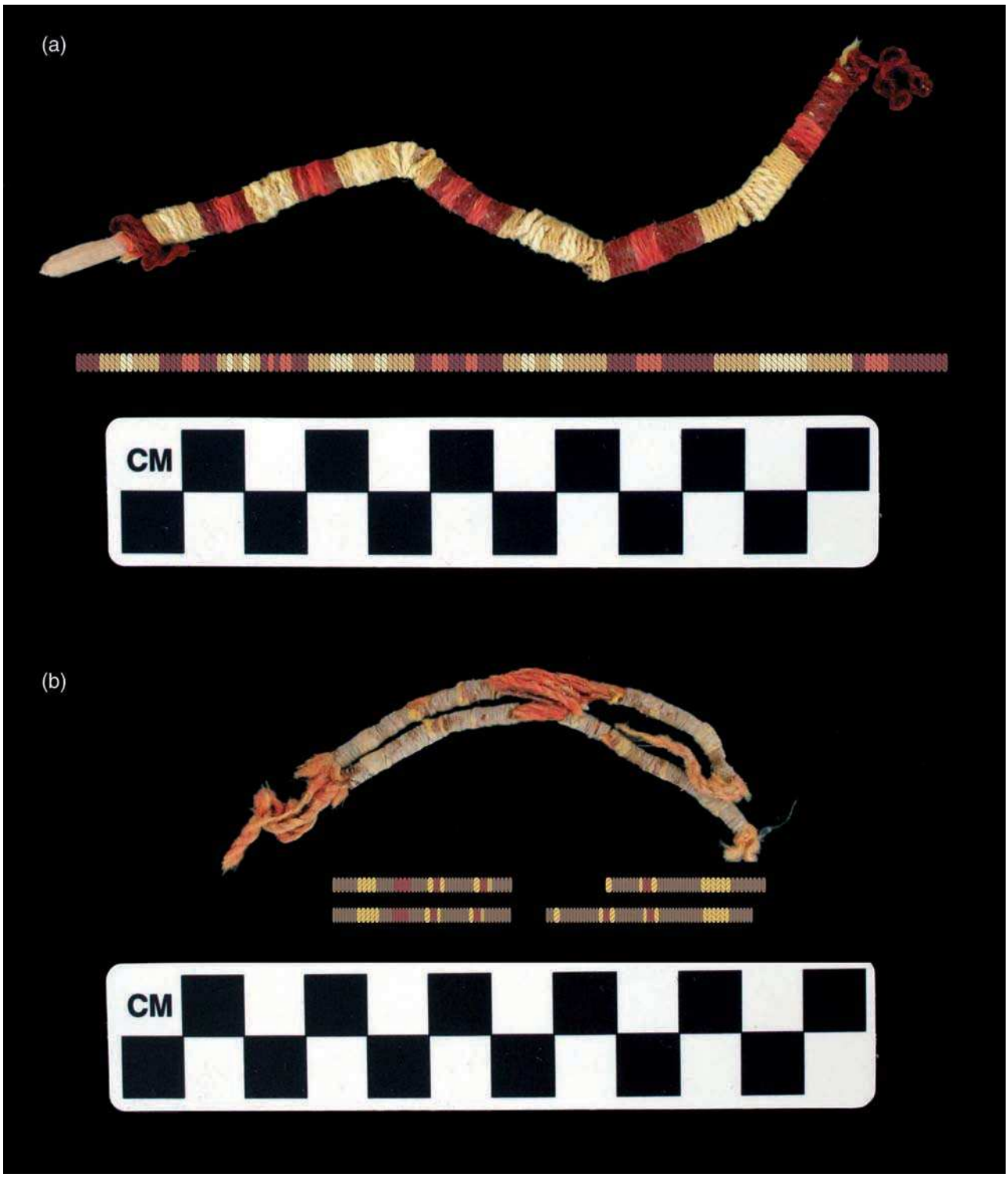


Figure 2–27. Two cords whose wrapping patterns look exotic: (a) Cord 8, (b) Cord 9.
(Source: Museo Regional de Ica. Cord 8 and Cord 9, 2003-L912B. Author's photographs and drawings.)

loops of the fringe yarn to the edge of the fabric (King 1965: 217, fig. 238; Splitstoser 2009: 948, fig. 947.948). Multicoloured fringes were frequently applied to Ocucaje and Necropolis textiles with a similar method involving a looped stitch (King 1965; Paul 1990a).

In fact, spiral structures are intimately associated with the edges of Necropolis and Early Nasca fabric selvedges. Cross-knit looping, a variation on looping (Emery 1966: 32), was applied to the selvedges of Necropolis and Early Nasca textiles, especially in tab fringes that were made separately and stitched to the fabric's selvedge. Cross-knit looping was also used to cover the seam between the tabs and selvedge (Paul 1990b: 14). If we recall the discussion of wrapping and how it both delimits and protects, it is interesting to note that a study by Anne Paul (2000) concluded that borders in Necropolis-style

fabrics served as protective perimeters that held in life forces.

Additional evidence for the significance of spiral structures can be seen in two Early Paracas textiles – both with imagery involving a figure(s) holding batons with coloured bands – that were excavated at Cerrillos. One fabric is made with slit tapestry within a plain-weave ground (Figure 2–28(a)), where vertical outlines were made by wrapping the warps with red weft yarns. The other fabric is plain weave with supplemental discontinuous wefts in weft face. (It is a type of weft-faced brocade with three wefts inserted between each ground weft.) (See Figure 2–28(b) and (c).) The central figure in this fabric is a fanged being holding two batons, one in each hand, and the remains of a third baton from a second figure can be seen at the edge of the fabric. The figures have red outlines made with sequential weft wrapping using supplementary wefts. Sequential weft wrapping has a spiral structure resembling stem-stitch embroidery. The spirals of the outlines have an S-slant where the outlines define body parts, but they have a Z-slant when defining the figures' batons, hat, and other accoutrements. (See Figure 2–28(d).) These fabrics compellingly suggest that Cerrillos weavers used spiral structures to convey categorical meaning.

Depictions of spirals and twisted strands are prominent in Late Paracas and Necropolis fabrics. Mary Frame established that many of the designs found on obliquely interlaced belts and headbands from Ocucaje and Necropolis, as well as in the designs of Early to Middle Paracas tapestries and painted plain weaves, are depictions of twisted strands and braided structures (Frame 1986). Both Mary Frame and Anne Paul have shown that the orientations of figures along the embroidered borders of Necropolis textiles depict twisted strands or spiral structures (Frame 1986, 1991, 2006; Paul 2001).

Finally, spirals are a relatively common type of lineal, geometric, geoglyph found within the Río Grande drainage basin (see Aveni 1990; Isla C. and Reindel 2005; Reiche 1949) which date to Early Nasca times (Nasca Phases 2 and 3) (Lambers 2006: 86, fig. 32). These lines are believed to have been ritually walked, presumably producing a living line of spiral movement.

Ethnographic and ethnohistorical evidence for the significance of spiral wrapping

Ethnographic analogy uses ethnohistorical data and ethnographic data to understand the meaning, usage, and/or cultural significance of archaeological objects (see Lyman and O'Brien 2001). Research methods developed in the last two decades have made significant progress using ethnographic analogy to recover ancient beliefs, sometimes called the archaeology of mind (Schlanger 1994). Ian Hodder summarised a method for the successful application of ethnographic analogy as 'a matter of evaluating similarities and differences between two contexts and discerning whether information can be transferred from one to the other', taking into account the spatial context, the temporal gap and some relevant dimension of variation (Hodder 1994: 149).

Paracas society is at least 1,800 years older than the oldest ethnohistorical sources, and during that time significant cultural changes took place in the Ica Valley, which calls into question whether ethnohistorical analogy can be used to analyse Paracas materials. Paracas people, including those who lived at Cerrillos, were clearly engaged with highland people (see for example Matsumoto and Cavero Palomino 2012), and many of the changes that took place in the Ica Valley since the Early Horizon involved contact with highland cultures (Inca and Wari). Hence, it is not out of the question to apply ethnohistoric and ethnographic analogy in the Paracas region, especially when studying deep structures that persisted through time. These are structures of the *longue durée* that remained viable from ancient times through the colonial period and which still shape Andean worldviews today.

That said, there are many case studies of highland communities whose people have active worldviews in which circular bodily movements are ritually charged. For instance, Astvaldar Astvaldsson notes:

> The Aymara and Quechua word for 'spiral' is *muyumuyu*, a composition derived from the root *muyu* (round, circular), also used to form verbs suggesting circular and spiral movement, e.g. rotate and revolve. In fact, the basic meaning of *muyumuyu* depicts that which goes around and around, which is borne out by the fact that *muyumuyu* is used to describe the act of turning around when dancing and that whirlwind in Aymara is *muyumuyu thaya*. (Astvaldsson 2000: 207–209)

Astvaldsson goes on to say:

> [S]piral forms and movements are widely used in the context of Andean rituals. For example, there are many spiral forms among

Figure 2–28. Cerrillos textile with baton-holding figures: (a) Fabric 2000-L095-S001, (b) Cerrillos specimen 2003-L061-S001; (c) detail of hand and baton of specimen 2003-L061-S001; (d) diagram of hand and baton indicating angle of twist in the outlines.

(Source: Museo Regional de Ica. (a) 2000-L095-S001; (b), (c) 2003-L061-S001. Author's photographs and drawing.)

> the symbolic sugar cubes that are the basic ingredient in today's most common ritual offering, the '*dulce misa*'. Spirals can represent serpents, which symbolise wisdom, power and lightning, a powerful celestial deity. Finally, circular movements described by the term *muyumuyu* (or verbs formed from the root *muyu*) are commonly used in Aymara rituals when placing the different ingredients into the *misa* or making libations. These movements can be made clockwise or anti-clockwise and their direction, respectively, depends on whether they are supposed to symbolise positive or negative qualities, for example, whether they are designed to attract benevolent deities or thwart a potential curse. (*ibid*.)

In the town of Sullka Titi Titiri, Bolivia, where Astvaldsson worked, there is a stone *wak'a*, whose spirals on its head are repeatedly mentioned as one its key features and are clearly thought to be exceptional and, thus, representative of special powers (*ibid.*). In another area of the Andes, Joseph Bastien notes that snails, because of their spiral shells, are held to have magical properties (Bastien 1978: 110).

Turning to ethnohistorical sources referring to spirals, Pablo Joseph de Arriaga, for instance, noted that among the many types of huacas of the colonial period were *pirauzara*, which are ears of corn whose rows of kernels 'spiral like a snail shell' (1968 [1621]: 31). Perhaps the most pertinent ethnohistorical examples of spiralling come from two chroniclers, Miguel Cabello Balboa (1951 [1586]: 393–394)[13] and Joan de Santa Cruz Pachacuti Yamqui Salcamaygua (1995 [1613]: [fol. 4r] 9, 11; [fol. 28v] 85),[14] who wrote that the Inca recorded information by wrapping coloured yarns on wrapped sticks.[15]

Discussion

It was noted in previous discussion that there are iconographic and archaeological associations between the Cerrillos wrapped batons and cords, and objects with spiral structures, such as slings, fans, and wigs. Archaeological and ethnographical/ethnohistorical analogy suggests the Cerrillos wrapped objects also have strong associations with staffs, borders (both territorial and textile selvedges), heads and beans, and fringes, which are linked to borders and *khipu*.

There are similar ethnographic associations. For example, in the town of Chinchero, Paul (citing personal communication with Ed and Chris Franquemont) notes:

> During the running of their ayllu boundaries, a land-based ritual called *mujonomiento*, they [Chinchero men] gather for drinking, dancing, and the playing of music. The ayllu's officers bring with them their staffs of office and plant them in the ground, indicating a formal governmental occasion. (Paul 1990a: 19)

Denise Arnold and Christine Hastorf suggest that these staffs of office, called *varas*, derive their power from and have come to represent heads (Arnold and Hastorf 2008: 122), and these head-*varas* are intimately associated with *ayllu* boundaries (and hence their territorial identity). If we recall the discussion about textiles, borders, spiral structures, and fringes, it is interesting to note that the imagery on cross-knit looped, tabbed fringes of Necropolis and Early Nasca embroidered fabrics often depicts front-facing heads (Sawyer 1997: 106–107, 153, figs. 172–174, 130).

This relationship between heads and fringes continued into Late Horizon times, where it was reified in the Inka royal emblem, called the *mascapaycha*, which included 'a lower fringe of red woollen threads, each thread representing [the head of] a slain enemy' (Murúa 1962 [1611–1616]: bk 1, ch. 9; cited in Zuidema 1990: 164). Sometimes the tabbed fringe of Necropolis and Early Nasca embroidered fabrics are decorated with multicoloured or variegated beans called *pallares* (Sawyer 1997: 116–117, 101, 127, figs. 186–187, 101, 152).[16] Keeping in mind the fringe-like nature of *khipu*, Frank Solomon noted that a particular mottled, bi-coloured *khipu* cord in Tupicocha, Peru, is called '*pallari* or *pallarado* or *pallaradito*, alluding to speckled beans' (Salomon 2004: 157).[17]

These examples provide compelling evidence that, during the Late Horizon, there were probably strong conceptual links between staffs, heads (and beans), perimeters (and territoriality and identity), and fringes (including the *mascapaycha* and *khipu*), and that these deeply held beliefs about the world, structures of the *longue durée*, likely circulated in some early form in Late Paracas times.

The visual semiotics of band patterns

The previous discussion showed that there is archaeological, ethnohistorical, and ethnographic

evidence for the ritual and symbolic importance of spiral structures and spiral movements. It revealed the archaeological associations between the Cerrillos wrapped batons and cords, and borders, fringes, heads, and beans, arguing that there were conceptual links between these objects that persisted into the Late Horizon. Some of these concepts and structures are embedded in *khipu*, which prompts the question: were Cerrillos wrapped batons and cords 'proto-*khipu*'? Was wrapping used to encode meaning? If so, what kind of information was conveyed, and how was it 'read'?

To answer these questions, I will consider theories about symbols, in particular visual semiotics, which is the study of non-representative art as a symbolic system rather than a language (Barthes 1977; Saussure 2004). Language models treat symbols as 'codes' to be deciphered, but this approach has not proven productive for studying visual symbols and non-representative art, such as the messaging in cloth (McCracken 1987). More useful is the field of visual semiotics developed by Charles Peirce (1931–1935 [1902]), where visual symbols or signs can be classified into three types: iconic, indexical, and symbolic, in which any individual 'symbol' (colour, shade, final twist, etc.) almost certainly had multivalent or polysemic significance, in the sense of multiple simultaneous meanings.

Indexical signs are those that are in some actual proximal or physical contact with their referents (for instance a weathervane). Examples of indexical signs that use band patterns can be found in gas chromatography and pH measurements, where results are directly related to the motion of molecules through a jell, or, in the case of pH, a band of colour corresponding to pH is produced when acid chemically reacts with test strips. Because of the proximal relationship between the sign and referent in indexical systems, it seems unlikely that the band patterns found on Cerrillos wrapped batons and cords functioned as indexical signs.

By contrast, iconic signs are based on their resemblance to a referent. An example of the use of iconic referents can be found in Inka *khipu* where knots were used to represent numbers. The number of loops in a long knot indicates the number, and zero is the absence of a knot.[18] Similarly, quantity was possibly encoded in Cerrillos wrapped batons and cords by counting the number of wrappings in a band. A similar example is found in *musa waraña*, 'whose wrappings replicate the colour combinations of warp threads in warping up the textile structure on the loom' (Arnold and Espejo 2012: 181). Each wrapped stick represents the pick-up pattern (colour and count) for one weft shot in a warp-faced textile.

Lastly, symbolic signs stand for their referent through convention. Their meaning is arbitrary and based on cultural argument or habit, such as the colours used in traffic signals. Symbolic systems are typically used to convey abstract ideas (see Washburn 2004), which makes it difficult, if not impossible, for 'outsiders' to understand their meaning, especially when the symbolic system was practised by people for whom historical analogy (discussed above) is problematic.

There are many examples of the use of coloured bands to symbolically convey information. For instance, in the electronics industry today, coloured bands are used to record resistance, where colours represent numbers: black = 0; brown = 1; red = 2; orange = 3; yellow = 4; green = 5; blue = 6; violet = 7; grey = 8; and white = 9. The Inkas used colour and twist in *khipu* to symbolically categorise information (Urton and Brezine 2005).

In another example of a symbolic system, US military service ribbons and ribbon bars have band patterns that represent a service member's military achievements. Specifically, service ribbons are strips of cloth that are attached to the actual medal at one end and pinned to the uniform at the other. Ribbon bars, on the other hand, are representations of service ribbons, duplicating the colour and band pattern, and are mounted on medal bars that have a pin on the back that allows them to be fastened to a uniform. While ribbon patterns are largely recognisable to members of the military, they are mostly unintelligible to outsiders. Perhaps the band patterns in Cerrillos wrapped batons and cords functioned like military service ribbons, representing status, achievement, group, individual rank, or location. The comparison is particularly interesting, because military service bars are iconic representations of military service ribbons, making them both iconic and symbolic, rather in the way that *warañas* represent warp designs, which also represent communities and families (Arnold and Espejo 2012).

Yet another example of a symbolic system can be found in the warp-striped patterns of seed bags in the Chilean highland town of Isluga. The stripes come in groups of three, where two thin stripes representing offspring surround a thick central stripe representing their mother. There are rules guiding the proper placement of colour and shade, as well as where they can be placed on the bag to create a pattern of symmetry that also defines the bag's mouth and other parts. These patterns create

complex meanings that are understood within the community, such as the kind of seeds contained in the bag (Cereceda 1986; see also Arnold 1997).

Another apt analogy of a symbolic system that uses band patterning to communicate abstract and complex ideas can be found among the Zulu of South Africa. Frank Jolles has shown that coloured bands in beaded bracelets or anklets 'can be used as a vehicle for the transmission of information in a number of different ways: 1) to define clan or regional identity, 2) as social regulators, or 3) to convey personal messages' (2004: 109). This is accomplished through coloured bands that have multiple meanings and priorities attached to them. For example, individual colours can have a positive or negative connotation, which is determined by the general context of the beaded object, and the juxtaposition of the colours within it. In addition, colours have social, environmental, and linguistic contexts, which can be expressed in multiple different ways. When individual colours are combined into groups of two or three, more elaborate ideas are rendered, which are complex but not precise. For example, in one region, red with black indicates that a person is married with children, while blue with black indicates that a woman was a virgin when she married (2004: 103–109), but in another region, red and black indicates the desire to get married.

Conclusions and future research

This chapter seeks to understand a group of wrapped batons and wrapped cords excavated from the Paracas site of Cerrillos. Four separate studies were undertaken: (1) the way they were made, including the choices that were involved in their making; (2) their archaeological context and associations; (3) the archaeological and ethnographic evidence for the importance of wrapping; and (4) their band patterns.

The results of the study suggest the Cerrillos wrapped batons and wrapped cords most closely resemble Middle Horizon and Inka *khipu*, as well as Colonial and modern *musa waraña*, as weaving models for colour patterns. They also suggest that the band patterns in the Cerrillos wrapped batons and cords are most similar to systems of repetition, symmetry, number, colour, and orientation found in the Necropolis embroideries, suggesting that: (1) the band patterns in the Cerrillos wrapped batons and wrapped cords were meaningful; and (2) they followed a logic, a 'code', that was most likely 'part of a broader cultural phenomenon that drew on the inherent properties of fibre constructions for the properties of graphic or tactile codifications' (Frame 2006: 410).

Visual semiotics suggests that this code most likely incorporated a combination of iconic and symbolic systems that operated on multiple levels. Polysemic attributes of colour (including shade and 'state', through natural versus dyed yarns), number, and direction (twist and ply) were combined, creating even more complex meanings, which Umberto Eco (1986) considers 'text', but whose content is multilevel discourse. These patterns were structured through a framework of symmetry, repetition, substitution, omission, addition, and inverses, adding almost exponentially expansive layers of complexity to their potential to encode information.

Archaeological context and associations provided insight into what might have been encoded in band patterns, suggesting there were strong ideological connections between the Cerrillos wrapped batons and wrapped cords, and batons/heads, slings/fans, and fringes/borders. The study of spiral motions and spiral structures strengthened the validity of these associations, disclosing deeply held conceptual associations between staffs/batons, heads, cords, territory, and identity. All this suggests that the Cerrillos wrapped batons and wrapped cords were political devices associated at the very least with territory and identity. For example, it was noted that Inka *khipu* have introductory segments, which Urton and Brezine (2005: 1067) believe functioned as place identifiers, indicating where a *khipu* came from. Similarly, the patterns found in *musa waraña* are associated with particular regions, and there are strong resemblances, both formally and structurally, between wrapped batons and *musa waraña*. In fact, there are several Late Paracas textiles from Cerrillos that have complex warp stripe patterns, such as the one in Figure 2–29, that could have easily been encoded in either a wrapped baton or a *musa waraña*. Thus, it is possible that wrapped batons also functioned as place identifiers. Wrapped cords, on the other hand, are much more complex than *musa waraña*, and might have functioned more like the cords of Middle Horizon *khipu*.

Future research focusing on the contents of the tomb will refine our understanding of its archaeological context. This might also answer important questions regarding not only the relationships between the wrapped batons and cords, and the principal occupant of the tomb, but, by identifying his or her gender – and assuming that the Cerrillos wrapped batons and cords represent a node in the development of *musa waraña* and *khipu* – we might

Figure 2–29. Warp-faced plain weave with multiple stripes of various widths and colours, Cerrillos specimen 2000-L921-S001. (Source: Museo Regional de Ica, 2000-L921-S001. Author's photograph.)

better understand the relationship between *musa waraña* and *khipu*, where the latter is part of the female realm, and the former was used by men.

We might find additional clues to the workings of these objects through a careful application of practice theory, which posits that the choices people make when making things provide insight into normative cultural practices, as well as how, and to what extent, people deviated from them (for example Dobres 2000: 175). By looking at deviations from normal practices, we might find clues as to what was meaningful (and what was not). For instance, data about spinning practices indicate an overwhelming preference for Z-spinning at Cerrillos (Splitstoser 2009: 369–373), and almost all the wrapping and braiding yarns found in the wrapped batons and cords are Z-spun; however, counter-spun (S) yarns are present, and patterns regarding where they appear (or do not appear) can provide clues about their significance. The same type of analysis can be done for knot direction, colour, ply, number, and instances of pattern inversion, omissions, and additions.

Finally, the author is conducting a detailed study of the wrapping patterns of Middle Horizon *khipu*, collecting information about yarn structure, colour,

count, wrapping structures, and knotting information (some Middle Horizon *khipu* are also knotted like Inka *khipu*). It is hoped that this research will provide a dataset that is absent, yet necessary for scholars to understand the evolution of *khipu* from its possible beginnings in Late Horizon Cerrillos wrapped batons and wrapped cords to the Late Horizon.

Acknowledgements

This chapter was prepared from a talk first presented in 2003 at the Northeast Conference on Andean Archaeology and Ethnohistory at Harvard University. A significantly revised and updated version was presented at the International Conference, 'Textiles, *Techne*, and Power in the Andes', held at Birkbeck, University of London, 15 March 2012. I wish to thank Mercedes Delgado A. and Dwight Wallace of the Cerrillos Archaeological Project and Susana Arce of the Ica Regional Museum for their support. Anne Pollard Rowe, Denise Arnold, Lynn Meisch, and Mary Frame have been especially helpful in my research, and I wish to thank Christopher Calvert, Mary Frame, and Denise Arnold for their editorial assistance. Finally, I am grateful to the organiser, Denise Arnold, and co-organiser, Luciana Martins, for inviting me to participate in the symposium that gave rise to this important volume.

References

Adovasio, J. M. 1977. *Basketry Technology: A Guide to Identification and Analysis*. Chicago: Aldine Publishing Company.

Allen, C. J. 1997. 'When pebbles move mountains: iconicity and symbolism in Quechua ritual.' In *Creating Context in Andean Cultures*, Howard-Malverde, R. (ed.) 73–84. Oxford Studies in Anthropological Linguistics. New York and Oxford: Oxford University Press.

Arellano, C. 1999. 'Quipu y tocapu: sistemas de comunicación inca.' In *Los Incas: arte y símbolos*, Pease, F. *et al.* (eds.): 215–261. Lima: Banco de Crédito del Perú.

Arnold, D. Y. 1997. 'Making men in her own image: gender, text, and textile in Qaqachaka.' In *Creating Context in Andean Cultures*, Howard-Malverde, Rosaleen (ed.): 99–131. Oxford Studies in Anthropological Linguistics. Oxford and New York: Oxford University Press.

Arnold, D. Y. and Espejo, E. 2012. 'Andean weaving instruments for textile planning: the *waraña* coloured thread-wrapped rods and their pendant cords.' *Indiana* 29(2012): 173–200.

Arnold, D. Y. and Hastorf, C. A. 2008. *Heads of State: Icons, Power, and Politics in the Ancient and Modern Andes*. Walnut Creek, CA: Left Coast Press.

Arriaga, P. J. de. 1968 [1621]. *The Extirpation of Idolatry in Peru*, Clark Keating, L. (ed. and trans.). Lexington: University of Kentucky Press.

Astvaldsson, A. 2000. 'The dynamics of Aymara duality: Change and continuity in sociopolitical structures in the Bolivian Andes.' *Journal of Latin American Studies* 32(1): 145–174.

Aveni, A. F. 1990. 'An analysis of the Cantalloc spiral.' In *The Lines of Nazca*, Aveni, Anthony (ed.): 307–312. Memoirs of the American Philosophical Society held at Philadelphia for Promoting Useful Knowledge 183. Philadelphia: The American Philosophical Society.

Barthes, R. 1977. 'Rhetoric of the image.' In *Image/Music/Text*, Heath, Stephen (trans.): 32–52. New York: Hill and Wang.

Bastien, J. W. 1978. *Mountain of the Condor: Metaphor and Ritual in an Andean Ayllu*. American Ethnological Society Monograph 64. St. Paul, MN: West Publishing Co.

Benson, E. P. and Conklin, W. J. 1981. *Museums of the Andes*, La Farge, H. A. (ed.). Great Museums of the World. Tokyo: Newsweek and Kodansha.

Cabello Balboa, M. 1951 [1586]. *Miscelánea antártica: una historia del Perú antiguo*. Lima: Universidad Mayor de San Marcos, Facultad de Letras, Instituto de Etnología.

Cereceda, V. 1986. 'The semiology of Andean textiles: the talegas of Isluga.' In *Anthropological History of Andean Polities*, Murra, J. V., Wachtel, N., and Revel, J. (eds.): 149–174. Cambridge and Paris: Cambridge University Press and Editions de la Maison des Sciences de l'Homme.

—— 1990. 'A partir de los colores de un pájaro.' *Boletín del Museo Chileno de Arte Precolombino* 4(1990): 57–104.

Conklin, W. J. 1982. 'The information system of Middle Horizon quipus.' In *Ethnoastronomy and Archaeoastronomy in the American Tropics*, Aveni, A. F. and Urton, G. (eds.): 261–281. Annals of the New York Academy of Sciences 385. New York: The New York Academy of Sciences.

Cook, A. G. 1999. 'Paracas: asentamientos Paracas en el Valle Bajo de Ica, Perú.' *Gaceta Arqueológica Andina* 25(June): 61–95.

Cordy-Collins, A. 1976. 'An Iconographic Study of Chavín Textiles from the South Coast of Peru: The Discovery of a Pre-Columbian Catechism.' Doctoral dissertation, University of California, Los Angeles, Department of Anthropology.

—— 1979. 'Cotton and the staff god: analysis of an ancient Chavín textile.' In *The Junius B. Bird Pre-*

Columbian Textile Conference, May 19th and 20th, 1973, Rowe, A. P., Benson, E. P., and Schaffer, A.-L. (eds.): 51–60. Washington, DC: The Textile Museum and Dumbarton Oaks.

—— 1999. 'Telas pintadas Chavín del Valle de Ica, Costa Sur' (Painted Chavín textiles from Ica Valley, South Coast). In *Tejidos milenarios del Perú / Ancient Peruvian Textiles*, Lavalle, J. A. de and Lavalle de Cárdenas, R. de (eds.): 107–141. Lima: Integra.

Daggett, R. E. 1994. 'The Paracas mummy bundles of the great Necropolis of Wari Kayan: a history.' *Andean Past* 4: 53–75.

D'Harcourt, R. 1962. *Textiles of Ancient Peru and Their Techniques*, Denny, G. C. and Osborne, C. M. (eds.), Brown, S. (trans.). Seattle: University of Washington Press.

DeLeonardis, L. 2005. 'Early Paracas cultural contexts: new evidence from Callango.' *Andean Past* 7: 27–56.

DeLeonardis, L. and Lau, G. F. 2004. 'Life, death, and ancestors.' In *Andean Archaeology*, Silverman, H. (ed.): 77–115. Blackwell Studies in Global Archaeology. Malden, MA and Oxford: Blackwell.

Desrosiers, S. 1986. 'An interpretation of technical weaving data found in an early 17th-century chronicle.' In *The Junius B. Bird Conference on Andean Textiles, April 7th and 8th, 1984*, Rowe, A. P. (ed.): 219–241. Washington, DC: The Textile Museum.

Dobres, M.-A. 2000. *Technology and Social Agency: Outlining a Practice Framework for Archaeology*. Malden, MA: Blackwell.

Drusini, A. G. 2009. 'Antropología y adaptación bio-cultural de los antiguos habitantes de Nasca / Anthropology and bio-cultural adaptation of the ancient Nasca inhabitants.' In *Nasca: El desierto de los dioses de Cahuachi / The Desert of the Cahuachi Divinities*, Orefici, G. (ed.): 152–167. Lima: Graph Ediciones.

Eco, U. 1986. *Semiotics and the Philosophy of Language*. Indianapolis: Indiana University Press.

Emery, I. 1966. *The Primary Structures of Fabrics: An Illustrated Classification*. Washington, DC: The Textile Museum.

Engel, F. A. 1976. *An Ancient World Preserved: Relics and Records of Prehistory in the Andes*, Kendall Gordon, R. (trans.). New York: Crown Publishers.

Engel, F. A., Nicho N., T., and Gutiérrez Ch., E. 1991. *Un desierto en tiempos prehispánicos: río Pisco, Paracas, río Ica*. Prehistoric Andean Ecology, Centro de Investigaciones de Zonas Aridas (CIZA). Lausanne, Switzerland: Fondation pour l'Étude des Problemes de Terres Arides.

Frame, M. 1986. 'The visual images of fabric structures in ancient Peruvian art.' In *The Junius B. Bird Conference on Andean Textiles, April 7th and 8th, 1984*, Rowe, A. P. (ed.): 47–80. Washington, DC: The Textile Museum.

—— 1988. 'Orientation and symmetry: the structuring of pattern repeats in the Paracas Necropolis embroideries. Research-in-progress report.' In *Textiles as Primary Sources, Proceedings of the First Symposium of the Textile Society of America, Minneapolis Institute of Art, September 16–18, 1988*, Vollmer, J. (ed.): 136–138. Earleville, MD: The Textile Society of America.

—— 1991. 'Structure, image, and abstraction: Paracas Necrópolis headbands as system templates.' In *Paracas Art and Architecture: Object and Context in South Coastal Peru*, Paul, A. (ed.): 110–171. University of Iowa Press.

—— 2001a. 'Beyond the image: the dimension of pattern in ancient Andean textiles.' In *Abstraction: The Amerindian Paradigm*, Paternosto, C. (ed.): 112–136. Brussels: Société des expositions du Palais des beaux-arts de Bruxelles.

—— 2001b. 'Blood, fertility, and transformation: interwoven themes in the Paracas Necropolis embroideries.' In *Ritual Sacrifice in Ancient Peru*, Benson, E. P. and Cook, A. G. (eds.): 55–92. Austin: University of Texas Press.

—— 2004. 'Motion pictures: symmetry as animator, classifier, and syntax in the Nasca embroideries of Peru.' In *Symmetry Comes of Age: The Role of Pattern in Culture*, Washburn, D. K. and Crowe, D. W. (eds.): 133–176. Seattle and London: University of Washington Press.

—— 2006. 'Elemental pathways in fiber structures: approaching Andean symmetry patterns through an ancient technology.' In *Narratives and Conversions: Proceedings of the 10th Biennial Symposium of the Textile Society of America, October 11–14, Toronto, Ontario*, Bier, C. and Perlman, A. S. (eds.): 406–414. Lincoln: Digital Commons, University of Nebraska – Lincoln. Online, consulted 25 December 2012: http://digitalcommons.unl.edu/tsaconf/348.

—— 2009. 'Desenvolviendo las dimensiones de significado de los bordados de Paracas Necrópolis.' In *Mantos para la eternidad: textiles Paracas del antiguo Perú*: 45–58. Madrid: Museo de América de Madrid.

—— In press. *From Structure to Cognition: The 'Logic of Models' in the Pattern Systems of Middle Horizon Tapestry Tunics*.

—— n.d. 'Conceptualizing space through structures, pathways, motions and maps: the plural models for symmetry patterns on ancient Andean textiles.' Paper presented to the International Conference, 'Textiles, *Techne*, and Power in the Andes', held at Birkbeck, University of London, 15–18 March 2012.

Franquemont, E. M. 2004. 'Jazz: an Andean sense of symmetry.' In *Embedded Symmetries: Natural and Cultural*, Washburn, D. K. (ed.): 81–94. Amerind

Foundation New World Studies 6. Albuquerque: University of New Mexico Press.

Franquemont, E. M. and Franquemont, C. R. 2004. 'Tanka, chongo, kutij: structure of the world through cloth.' In *Symmetry Comes of Age: The Role of Pattern in Culture*, Washburn, D. K. and Crowe, D. W. (eds.): 177–214. Seattle and London: University of Washington Press.

Fuchs, P. R., Patzschke, R., Yenque, G., and Briceño R., J. 2009. 'Del Arcaico Tardío al Formativo Temprano: las investigaciones en Sechín Bajo, valle de Casma.' In *El Periodo Formativo: enfoques y evidencias recientes. Cinquenta años de la Misión Arqueológica Japonesa y su vigencia. Segunda Parte*, Kaulicke, P. and Onuki, Y. (eds.): 55–86. Boletín de Arqueología PUCP 13. Lima: Fondo Editorial de la Pontificia Universidad Católica del Perú.

Guernsey, J. and K. Reilly, III, F. 2006. 'Introduction.' In *Sacred Bundles: Ritual Acts of Wrapping and Binding in Mesoamerica*, Guernsey, J. and K. Reilly, III, F. (eds.): v–xvi. Ancient America Special Publications 1. Barnardsville, NC: Boundary End Archaeology Research Center.

Hodder, I. 1994. *Reading the Past: Current Approaches to Interpretation in Archaeology*, 2nd edn. Cambridge: Cambridge University Press.

Ingold, T. 1988. 'Tools, minds, and machines: an excursion in the philosophy of technology.' *Techniques and Culture* 12: 151–176.

Isla C., J. and Reindel, M. 2005. 'New studies on the settlements and geoglyphs in Palpa, Peru.' *Andean Past* 7: 57–92.

Jolles, F. 1993. 'Traditional Zulu beadwork of the Msinga area.' *African Arts* 26(1): 42–53.

—— 2004. 'Continuity and change in Zulu beadwork conventions: the interaction of color and pattern.' In *Symmetry Comes of Age: The Role of Pattern in Culture*, Washburn, D. K. and Crowe, D. W. (eds.): 100–132. Seattle and London: University of Washington Press.

Kaulicke, P. 1997. *Contextos funerarios de Ancón: esbozo de una síntesis analítica*. Lima: Pontificia Universidad Católica del Perú.

King, M. E. 1965. 'Textiles and Basketry of the Paracas Period, Ica Valley, Peru.' Doctoral dissertation, University of Arizona, Tucson, Department of Anthropology.

Kroeber, A. L. 1937. *Archaeological Explorations in Peru, Part IV: Cañete Valley*, vol. II. Anthropology Memoirs 4. Chicago: Field Museum of Natural History.

Lambers, K. 2006. *The Geoglyphs of Palpa, Peru: Documentation, Analysis, and Interpretation*. Aichwald, Germany: Linden Soft.

Lange, K. E. 2003. 'Shaman or sacrifice?' *National Geographic* 204(3): 44–49.

Lothrop, S. K. and Mahler, J. 1957. *Late Nazca Burials at Chaviña, Peru*. Papers of the Peabody Museum of Archaeology and Ethnology 50. Cambridge, MA: Harvard University.

Lyman, R. L. and O'Brien, M. J. 2001. 'The direct historical approach, analogical reasoning, and theory in Americanist archaeology.' *Journal of Archaeological Method and Theory* 8(4): 303–342.

Makowski, K. 2000. 'Los seres sobrenaturales en la iconografía Paracas y Nasca.' In *Los dioses del antiguo Perú*, Makowski, K. (ed.): 277–307. Coleccion Arte y Tesoros del Peru 1. Lima: Banco de Crédito del Perú.

Marzio, F. 2007. *Miniature Size, Magical Quality: Nasca Art from the Glassell Collection*. Houston, TX: Museum of Fine Arts.

Massey, S. A. 1986. 'Sociopolitical Change in the Upper Ica Valley, B.C. 400 to 400 A.D.: Regional States on the South Coast of Peru (Paracas, Nasca, Topara).' Doctoral dissertation, University of California, Los Angeles, Department of Anthropology.

—— 1991. 'Social and political leadership in the lower Ica Valley: Ocucaje phases 8 and 9.' In *Paracas Art and Architecture: Object and Context in South Coastal Peru*, Paul, A. (ed.): 315–348. University of Iowa Press.

Matsumoto, Y. and Cavero Palomino, Y. I. 2012. 'Early Horizon gold metallurgy from Campanayuq Rumi in the Peruvian south-central highlands.' *Ñawpa Pacha* (Berkeley, CA) 32(1): 115–129.

McCracken, G. 1987. 'Clothing as language: an object lesson in the study of the expressive properties of material culture.' In *Material Anthropology: Contemporary Approaches to Material Culture*, Reynolds, B. and Stott, M. A. (eds.): 103–128. Lanham, MD: University Press of America.

Means, P. A. 1920. *Distribution and Use of Slings in Pre-Columbian America, with Descriptive Catalogue of Ancient Peruvian Slings in the United States National Museum*. Proceedings of the United States National Museum 55. Washington, DC: Government Printing Office.

Meisch, L. A. 2012. 'The Murúa code: handmade textiles not only represent an ancient tradition, but remain a part of everyday life in many Andean cultures.' *Natural History* 120(8). Online, consulted 23 December 2012: http://www.naturalhistorymag.com/features/112333/the-mur-a-code.

Menzel, D., Rowe, J. H., and Dawson, L. E. 1964. *The Paracas Pottery of Ica: A Study of Style and Time*. University of California Publications in American Archaeology and Ethnology 50. Berkeley and Los Angeles: University of California Press.

Murúa, F. M. de. 1962 [1611–1616]. *Historia general del Perú, origen y descendencia de los Incas*. Colección

Joyas Bibliográficas. Madrid: Bibliotheca Americana Vetus 1–2.

—— 2008 [1611–1616]. *Historia general del Piru: Facsimile of J. Paul Getty Museum Ms. Ludwig XIII 16*. Los Angeles: Getty Research Institute.

Pachacuti Yamqui Salcamaygua, J. de S. C. 1995 [1613]. *Relación de antigüedades de este reino del Perú*, Araníbar, C. (ed.). Lima: Fondo de Cultura Económica.

Paul, A. 1986a. 'The coloring of figures on a Paracas mantle.' In *Textile Conservation Symposium in Honor of Pat Reeves, 1 February 1986*, McLean, C. C. and Connell, P. (eds.): 10–20. Los Angeles: The Conservation Center, Los Angeles County Museum of Art.

—— 1986b. 'Un manto de Paracas: la coloracion de sus figuras.' *Boletín de Lima* 48(48): 19–30.

—— 1990a. *Paracas Ritual Attire: Symbols of Authority in Ancient Peru*. The Civilization of the American Indian Series. Norman and London: University of Oklahoma Press.

—— 1990b. 'The use of color in Paracas Necropolis fabrics: What does it reveal about the organization of dyeing, designing, and society?' *National Geographic Research* 6(1): 7–21.

—— 1992. 'Procedures, patterns, and deviations in Paracas embroidered textiles: traces of the creative process.' In *To Weave for the Sun: Ancient Andean Textiles in the Museum of Fine Arts, Boston*, Stone-Miller, R. (ed.): 25–33. New York: Thames and Hudson.

—— 2000. 'Protective perimeters: the symbolism of borders on Paracas textiles.' *Res: Anthropology and Aesthetics* 38: 144–167.

—— 2001. 'The multiple layers of meaning in a Paracas Necrópolis textile.' In *Approaching Textiles, Varying Viewpoints, Proceedings of the Seventh Biennial Symposium of the Textile Society of America, September 19–24, 2000, Santa Fe, New Mexico*: 210–220. Earleville, MD: The Textile Society of America.

—— 2004. 'Symmetry schemes on Paracas Necrópolis textiles.' In *Embedded Symmetries: Natural and Cultural*, Washburn, D. K. (ed.): 59–80. Amerind Foundation New World Studies 6. Albuquerque: University of New Mexico Press.

Peirce, C. S. 1931–1935 [1902]. 'Minute logic.' In *Collected Papers of Charles Sanders Peirce*, 6 vols., vol. II, Hartshorne, C. and Weiss, P. (eds.): 1–118. Cambridge, MA: Harvard University Press.

Peters, A. H. 1997. 'Paracas, Topara and Early Nasca: Ethnicity and Society on the South Central Andean Coast', 2 vols. Doctoral dissertation, Cornell University, Department of Anthropology.

—— 2005. 'Cabeza y tocado: significados en Paracas, Topará y Nasca.' In *Tejiendo sueños en el Cono Sur. Textiles andinos: pasado, presente y futuro (51st Congreso Internacional de Americanistas, Santiago, Chile, 14–18 julio de 2003, Actas del simposio ARQ-21)*, Solanilla Demestre, V. (ed.): 144–166. Barcelona: Grup d'Estudis Precolombins, Departament d'Art de la Universitat Autònoma de Barcelona.

Pezzia Assereto, A. 1968. *Ica y el Perú precolombino*. Arqueologia de la provincia de Ica 1. Ica, Peru: Ojeda.

Proulx, D. A. 2001. 'Ritual uses of trophy heads in ancient Nasca society.' In *Ritual Sacrifice in Ancient Peru*, Benson, E. P. and Cook, A. G. (eds.): 119–136. Austin: University of Texas Press.

Purin, S. (ed.). 1990. *Inca-Perú: 3000 ans d'histoire: Musées Royaux d'Art et d'Histoire, Bruxelles, 21.9–30.12.1990*, 2 vols., vol. II. Ghent, Belgium: Imschoot.

Reiche, M. 1949. *Los dibujos gigantescos en el suelo de las pampas de Nazca y Palpa: descripcion y ensayo de interpretacion*. Lima: Editora Medica Peruana.

Reid, J. W. 2005. *Magic Feathers: Textile Art from Ancient Peru*. London: Textile and Art Publications.

Reiss, W. and Stübel, A. 1998 [1880–1887]. *The Necropolis of Ancon in Peru: A Contribution to our Knowledge of the Culture and Industries of the Empire of the Incas*, facsimile edition, Carson, U. (ed.), Keane, A. H. (trans.) Vol. 1–15. Hanover, Germany. Originally published in 1880–1887, Berlin: A. Asher and Co.

Rickenbach, J. (ed.). 1999. *Nasca: geheimnisvolle Zeichen im alten Peru*. Zürich: Museum Rietberg Zürich.

Rowe, A. P. 2007. 'Plain weave on the backstrap loom: introduction.' In *Weaving and Dyeing in Highland Ecuador*, Rowe, A. P. (ed.): 13–46. Austin: University of Texas Press.

Salomon, F. 2004. *The Cord Keepers: Khipus and Cultural Life in a Peruvian Village*. Latin America Otherwise: Languages, Empires, Nations. Durham, NC and London: Duke University Press.

Saussure, F. de. 2004. 'Course in literary theory.' In *Literary Theory: An Anthology*, 2nd edn, Ryan, M. and Rivkin, J. (eds.): 59–71. Malden, MA: Blackwell Publishers.

Sawyer, A. R. 1997. *Early Nasca Needlework*. London: Laurence King Publishing.

Schlanger, N. 1994. 'Mindful technology: unleashing the *chaîne opératorie* for an archaeology of mind.' In *The Ancient Mind. Elements of Cognitive Archaeology*, Renfrew, C. and Zubrow, E. B. W. (eds.): 143–151. New Directions in Archaeology. Cambridge University Press.

Small, S. E. 2001 'Shamanism and hegemony: a Gramscian approach to the Chavin staff god.' *Kroeber Anthropological Society Papers* 85(2001): 68–90.

Splitstoser, J. C. 2009. 'Weaving the Structure of the Cosmos: Cloth, Agency, and Worldview at Cerrillos, an Early Paracas Site in the Ica Valley, Peru.' Doctoral dissertation, The Catholic University of America, Washington, DC, Department of Anthropology.

—— 2012 'The Parenthetical Notation Method for Recording Yarn Structure.' In *Proceedings of the 13th Biennial Symposium of the Textile Society of America, on Textile and Politics, September 19–22, 2012, Washington, D.C.*, Svenson Perlman, A. (ed.). Lincoln: Digital Commons, University of Nebraska – Lincoln. Paper 745. Online: http://digitalcommons.unl.edu/tsaconf/745.

Splitstoser, J. C., Wallace, D. T., and Delgado Agurto, M. 2010. 'Nuevas evidencias de textiles y cerámica de la época Paracas Temprano en Cerrillos, valle de Ica, Perú.' In *El Periodo Formativo: enfoques y evidencias recientes. Cincuenta años de la Misión Arqueológica Japonesa y su vigencia. Segunda Parte*, Kaulicke, P. and Onuki, Y. (eds.): 209–235. Boletín de Arqueología PUCP 13. Lima: Fondo Editorial de la Pontificia Universidad Católica del Perú.

Stafford, C. E. 1941. *Paracas Embroideries: A Study of Repeated Patterns*. New York: J. J. Augusti.

Stone-Miller, R. 1992. *To Weave for the Sun: Ancient Andean Textiles in the Museum of Fine Arts, Boston*, 67–205. New York: Thames and Hudson.

Tello, J. C. 1959. *Paracas: Primera Parte*. Lima: Empresa Gráfica T. Scheuch.

Tello, J. C. and Xesspe, T. M. 1979. *Paracas, Segunda Parte: Cavernas y Necropolis*. Lima: Universidad Nacional Mayor de San Marcos.

Urton, G. 2003. *Signs of the Inka Khipu: Binary Coding in the Andean Knotted-String Records*. The Linda Schele Series in Maya and Pre-Columbian Studies. Austin: University of Texas Press.

Urton, G. and Brezine, C. J. 2005. 'Khipu accounting in ancient Peru.' *Science* n.s. 309(5737): 1065–1067.

Van Gijseghem, H. 2004. 'Migration, Agency, and Social Change on a Prehistoric Frontier: The Paracas-Nasca Transition in the Southern Nasca Drainage, Peru.' Doctoral dissertation, University of California, Santa Barbara, Department of Anthropology.

Von Hagen, A. and Morris, C. 1998. *The Cities of the Ancient Andes*. London: Thames and Hudson.

Wallace, D. T. 1962. 'Cerrillos, an Early Paracas site in Ica, Peru.' *American Antiquity* 27(3): 303–314.

—— 1979. 'The process of weaving development on the Peruvian coast.' In *The Junius B. Bird Pre-Columbian Textile Conference, May 19th and 20th, 1973*, Rowe, A. P., Benson, E. P., and Schaffer, A.-L. (eds.): 27–50. Washington, DC: The Textile Museum and Dumbarton Oaks.

Wallace, D. T., Splitstoser, J. C., Delgado Agurto, M. *et al.* 2005. 'Feathered effigy/burial from Cerrillos, Ica Valley, Peru.' In *Tejiendo sueños en el Cono Sur. Textiles andinos: pasado, presente y futuro (51st Congreso Internacional de Americanistas, Santiago, Chile, 14–18 julio de 2003, Actas del simposio ARQ-21)*, Solanilla Demestre, V. (ed.): 128–143. Barcelona: Grup d'Estudis Precolombins, Departament d'Art de la Universitat Autònoma de Barcelona.

Washburn, D. 2004. 'The genesis of realistic and patterned representations in archaeology.' In *Embedded Symmetries: Natural and Cultural*, Washburn, D. K. (ed.): 47–58. Amerind Foundation New World Studies 6. Albuquerque: University of New Mexico Press.

Washburn, D. K. and Crowe, D. W. 1988. *Symmetries of Culture: Theory and Practice of Plane Pattern Analysis*. Seattle and London: University of Washington Press.

Yacovleff, E. 1933. 'Arte plumaria entre los antiguos peruanos.' *Revista del Museo Nacional* 2(2): 131–136.

Yacovleff, E. and Muelle, J. C. 1934. 'Un fardo funerário de Paracas.' *Revista del Museo Nacional* 3(1–2): 63–153.

Zuidema, R. T. 1990. 'The royal whip in Cuzco: art, social structure and cosmology.' In *The Language of Things: Studies in Ethnocommunications in Honour of Professor Adriana A. Gerbrands*, Keurs, P. ter and Smidt, D. (eds.): 159–172. Leiden: Rijksmuseum voor Volkenkunde.

Notes

1 The site was first excavated by Dwight Wallace in 1958 (Wallace 1962); Wallace resumed excavations in 1999 and worked with co-director Mercedes Delgado Agurto from 2000 to 2003 (Lange 2003; Splitstoser *et al.* 2010; Wallace *et al.* 2005).

2 A detailed description of the tomb contents will be published by Delgado and Splitstoser.

3 A detailed technical description of the fabric structure is as follows: the fabric's dimensions were approximately 74 × 11 cm, but it is now in two pieces, 51 × 11 cm and 23 × 10 cm. The ground weave is warp-predominant, tan (Pantone® 16-1334), cotton, plain weave with S(2z) warps and I(2z) wefts interworked 1/1. Each warp end has 14 bands (each consisting of four weft-shots) of weft-faced plain weave with S(2z), camelid-hair wefts interworking ground warps 2/2; colours are earth-red (Pantone® 18-1631) and golden-yellow (15-0953) alternating with bracken/black (19-1015). At the intersection of warp-predominant, cotton, plain weave and weft-faced, camelid hair, plain weave, there are gauze crosses, where every other warp pair is crossed. In the centre of each group of weft-faced, plain weave, weft bands there is a band (10 weft shots) of two-colour, complementary-weft patterning with weft substitution using I(2s(2z)) wefts interworking pairs of ground warps with over three under one (notated as 3/1), 1/1 and occasionally

2/2. The colours in the complementary-weft patterning are red-earth and bracken at one warp end, and golden-yellow and bracken at the other. The design looks foreign and consists of interlocked stepped triangles with dots in their centres. Both warp selvedges have two shots of S(3z(2s)) heading-cord yarns interworked 1/1. The weft selvedges are simple and both have four earth-red outer warps interworked 1/1 in warp-faced, plain weave.

4 Yarn structure is notated using a system developed by the author called 'parenthetical notation', in which the letters S, Z, and I represent S-spun, Z-spun, and unspun yarns, respectively. Parentheses determine the order of operations, beginning with the innermost parenthesis, and numerical coefficients indicate the number of yarns that are twisted together. In this example, I(2s(2z)), two z-spun yarns are plied S, and two of these yarns are combined but not twisted. (For a more detailed description of parenthetical notation, see Splitstoser 2012).

5 This is the only cotton yarn found in the entire collection.

6 They are typically red, auburn, pink, gold, brown, tan, and sometimes black. Cereceda (1986: 158–159; 1990) might suggest that many of these colours are shades of one colour, which are classified into bright and dull, natural and dyed, etc.

7 Denise Arnold and Christine Hastorf (2008) have demonstrated the importance of both head taking and head curating, which involves wrapping and bundling in Andean culture, particularly during the Late Paracas period, when head-taking practices seem to have begun on the South Coast (see also DeLeonardis and Lau 2004, and Pezzia Asserto 1968: 99–101).

8 Excavated heads, however, are hung from cords, not slings, although some of the cords are braided (see for example Drusini 2009: 159; Rickenbach 1999: 327, fig. 167).

9 The archaeological literature is full of references to human hair, often braided, that was wrapped with colourful yarns (see King 1965: 242; Lothrop and Mahler 1957: pl. 7). Elizabeth King reported a three-strand braid of human hair wrapped with multicoloured yarns.

10 I suggest a Late Paracas/Early Nasca date for some of these wigs based on recent evidence from the dating of geoglyphs. An anthropomorphic geoglyph in the Palpa region includes a hat with long, fringe- or cord-like streamers that hang down (Lambers 2006: 97, Map 96, Geoglyph 96). It dates to Late Paracas times (Ocucaje 8 and 9) (Isla C. and Reindel 2005: 60–61; Lambers 2006: 91, 94).

11 San Ignacio de Loyola is situated in the Moche and Sinsicap river valleys almost due east of Trujillo.

12 Editors' note: However, there is evidence that European weavers do wrap warp yarn around sticks to calculate the thread count.

13 *'... sintiendose cercano de la muerte hizo su testamento segun entre ellos era costumbre, y en una vara larga (a manera de baculo) fueron poniendo rayas con distintas colores en que se conocia y entendia su ultima y postrimera voluntad, lo qual le fue dada en guarda á el Quipocamayoc (que era como entre nosotros el Escriuano, ó Secretario) dejó nombrados por su Albaceas y Testamentarios á Colla Topa y a Catumgui y a Tauri machi y Auqui Topayupangui, y a otros tres o quatro Principales Capitanes y deudos cercanos suyos y debajo deste testamente murio el valeroso y buen Caudillo y Rey Guayna Capac auiendo señoreado y mandado el Ymperio poco más de 33 años subcedio su muerte (a nra cuenta) año de 1525. Por el mismo tiempo que Pizarro, Luque y Almagro se andauan aprestando para explorarle su Reyno ya pacificamente poseido su muerte se cayo por algunos dias temiendose todos los del Cuzco de algunas novedades y alteraciones que suelen acudir á tales coyunturas mas siendo embalsamado su cuerpo (como entre ellos eran costumbre) juntaronse los testamentaros y albaceas juntamente con el Quipo Camayoc (o Escribano) y atentamente consideraron lo que los Quipos y ñudos declarauan, y interpretado con la deuida y necesaria fidelidad parecia auer hecho nuevo y ultimo nombramiento de unico y universal heredero y subcesor del Ymperio en un hijo que consigo traia a quien amava mucho llamado Ninancuyuchic, que en esta coyuntura estaua enfermo de calenturas de las quales en pocos días murio,y quedose Guascar Ynga con lo que primero tenia. Hallaron también por los Quipos el orden que se auia de tener en llebar su cuerpo á el Cuzco, y como se auia de entrar triumphando, y guardando ansi en esto (como en todo lo demas) lo mandado por el muerto Rey llevaron su cuerpo de Quito á Tumibamba y alli repararon hasta poner en orden el Govierno de la tierra y lo necesario para tan largo viage probeyeron los Albaceas de el muerto Guaynacapac por Governador de la tierra, a un Quigal topanatural de Cuzco, y dejaronle las compañias de Soldados que parecio combenir ...'* (Miguel Cabello Balboa 1951 [1586]: 393–394).

14 *'Este varón dicen que llegó al pueblo de un cacique llamado apo Tampo, a quien estaba sujeto el pueblo. Dicen que llegó muy cansado a una fiesta, cuando estaban en unas bodas. Por el apo Tampo fueron oídos sus razonamientos con amor y los indios a él sujetos los oyeron de mala gana. Por aquel día fue huésped el peregrino, el cual dicen que dio un palo de su bordón al apo Tampo reprendiéndolo con amor afable y el apo Tampo lo oyó con atención recibiendo el palo de su mano. De modo que en un palo recibieron lo*

que les predicaba, señalándoles y rayando cada capítulo de las razones' (Santa Cruz Pachacuti Yamqui Salcamaygua 1995 [1613]: [f. 4r] 9, 11). 'En este tiempo el inca despacha a Caçir cápac por visitador general de las tierras y pastos, dándole su comisión en rayas de palo pintado' (*ibid.*: [f. 28v] 85).

15 I thank Galen Brokaw for alerting me to, and providing, these two references.

16 Recall that one of the cord sets found at Cerrillos was wrapped around a bag containing *pallares*.

17 The relationship between beans and heads might express notions of transformation and regeneration (Arnold and Hastorf 2008; Cereceda 1986). A bundle excavated by Tello at Wari Kayan on the Paracas Peninsula contained not a body, but 12 kg of black beans (Daggett 1994: 57), and apparently this bundle is not unique. Perhaps the Cerrillos wrapped batons and cords were also involved with concepts and/or practices of regeneration.

18 The number one, however, is represented with a figure-of-eight knot, which is not the equivalent of a single-loop (overhand) knot. Thus, the figure-of-eight knots function as symbolic signs (discussed below) in Inka *khipu*.

Textiles, Technical Practice, and Power in the Andes

Edited by Denise Y. Arnold with Penelope Dransart

Archetype Publications

First published 2014 by Archetype Publications Ltd

Archetype Publications Ltd
1 Birdcage Walk
London SW1H 9JJ
www.archetype.co.uk

© Copyright is held jointly among the authors and Archetype Publications

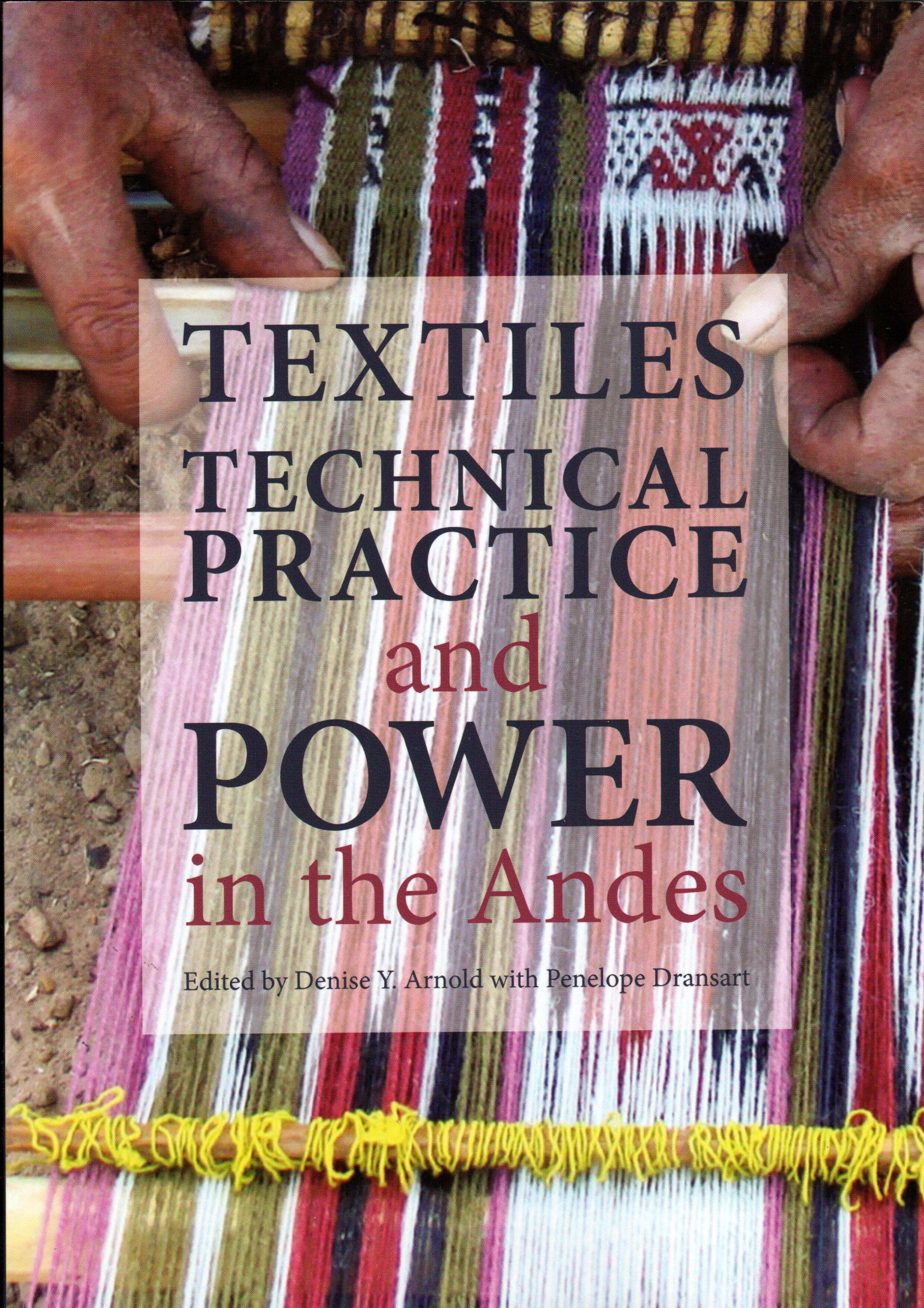
The views and practices expressed by individual authors are not necessarily those of the editors or the publisher. The authors and publisher cannot take any responsibility for any harm or damage that may be caused by the use or misuse of any information contained therein.

ISBN: 978-1-909492-08-0

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanic, photocopying, recording or otherwise, without the prior permission of the publishers.

Project management and cover design by Out of House Publishing
Cover photograph by Elvira Espejo, in the ILCA Collection
Typeset by Newgen Knowledge Works Pvt Ltd
Printed by Harrier LLC, Newton Abbot, Devon, UK



TEXTILES TECHNICAL PRACTICE and POWER in the Andes

Edited by Denise Y. Arnold with Penelope Dransart